Lake Mead National Recreation Area

National Park Service
U.S. Department of the Interior

Lake Mead National Recreation Area
Nevada

Environmental Assessment
Rehabilitate Northshore Road Project
February 2003

ENVIRONMENTAL ASSESSMENT

Rehabilitate Northshore Road Project

Prepared For:
National Park Service

Prepared By:
engineering-environmental Management, Inc.

Lake Mead National Recreation Area
Nevada

U.S. Department of the Interior
National Park Service

Rehabilitation of Northshore Road
Lake Mead National Recreation Area
Clark County, Nevada

Summary

At Lake Mead National Recreation Area, the National Park Service proposes to rehabilitate and reconstruct a 9.5-mile segment of Northshore Road. This action is needed to improve poor pavement conditions, rehabilitate deteriorated and inadequate drainage facilities, and reduce traffic accidents.

This environmental assessment examines in detail two alternatives: no-action and the National Park Service preferred alternative. The preferred alternative includes the rehabilitation of the existing roadway starting at milepost (MP) 20.8 and ending at MP 30.3. (Currently, the project ends approximately at MP 28.7, but will extend to MP 30.3 with available funding. Therefore, this environmental assessment addresses activity to MP 30.3.) The roadway would be rehabilitated on the existing road bench to an average width of 32 feet, as is currently present. The 32-foot road width would include two 12-foot-wide paved travel lanes, and two 4-foot-wide paved shoulders. Curves would be widened in high-accident locations. Some horizontal and vertical alignment would be adjusted to improve safety. The segment of Northshore Road between MPs 24.7 and 25.3 would be reconstructed. This road section contains three curves and a parking lot with call box (telephone). Reconstruction would be comprised of increasing the curve radii to 700 feet and adding turn lanes into the parking lot. One turnout at MP 24.6 would be removed from this segment of the road to eliminate safety hazards.

The traffic configuration at Redstone parking area would be changed to improve circulation for buses and improve parking. The new parking lot would be formalized with curb and gutters, and sidewalks would be added. The Boxcar Wash culvert at MP 10.5, and 15 additional culverts would be doubled in size to meet 50-year or longer storm events to improve flood control.

The preferred alternative would have no or negligible impacts on cultural resources, wetlands, prime and unique farmlands, ecologically critical areas, environmental justice, park operations, and natural soundscapes and lightscapes. Short-term, negligible to minor, adverse impacts on biotic communities, air quality, floodplains, and threatened and endangered species would result from road reconstruction activities. Impacts to water quality from erosion and sedimentation would be short term and negligible to minor, and long term and slightly beneficial. Short-term air quality impacts from dust and emissions would be adverse and minor. Impacts to soils would be long term, localized, adverse, and minor.

Short-term impacts on visitor use and experience would be minor and adverse if construction occurs during nonpeak visitation periods. If the project extends into peak season or weekends, impacts would be moderate. Long-term visitor use and experience impacts from road improvements would be moderately beneficial. Short-term health and safety impacts would be slightly beneficial; long-term health and safety impacts would be moderately beneficial, resulting from improved sight distances, wider travel lanes, and circulation improvements.

Notes to Reviewers and Respondents

This environmental assessment is available on the Lake Mead National Recreation Area Internet Web site. It is being distributed for public and agency review and comment for a period of 30 days.

If you wish to comment on the environmental assessment, you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. *If you want us to withhold your name and address, you must state this prominently at the beginning of your comment*. We will make all submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to: William A. Dickinson, Superintendent; Lake Mead National Recreation Area; Attn: Northshore Road Project; 601 Nevada Way; Boulder City, NV 89005

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ACRONYMS AND ABBREVIATIONS

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
CBC	concrete box culvert
CFR	Code of Federal Regulations
CMP	corrugated metal pipe
°F	Degrees Fahrenheit
EA	Environmental Assessment
MP	Milepost
MVMT	million vehicle miles traveled
NEPA	National Environmental Policy Act of 1969, as amended
NNHP	Nevada Natural Heritage Program
NPS	National Park Service
NRA	National Recreation Area
PL	Public Law
SHPO	State Historic Preservation Office
U.S.	United States
USC	United States Code
USFWS	U.S. Fish and Wildlife Service

INTRODUCTION

PURPOSE AND NEED FOR ACTION

The National Park Service (NPS) is considering rehabilitating and reconstructing a 9.5-mile segment of Northshore Road and modification of an inadequate concrete box culvert (CBC) carrying intermittent flows of Boxcar Wash within Lake Mead National Recreation Area (NRA), Clark County, Nevada (figure 1). This Northshore Road segment between mileposts (MP) 20.8 to 30.3 carries visitors from Lakeshore Scenic Drive and Nevada Highways 146 and 147, north to Interstate Highway 15. Access to the Las Vegas Bay, Government Wash, Callville Bay, Echo Bay, and Overton Beach area of Lake Mead is provided along this highway corridor. The project is needed to improve poor pavement conditions and inadequate drainage facilities. The one existing culvert is in fine condition, but repeated actual flood events have shown that only one culvert is not sufficient to carry flood flows without the road being damaged. The project is also intended to reduce accidents between MPs 24.7 and 25.3, on what is considered one of the most dangerous roads in the national park system based on the number of accidents that occur annually (USDI-NPS 1994).

As a part of this proposed action, the National Park Service is also considering the reconstruction of a CBC located in Boxcar Wash at MP 10.5 on Northshore Road (figure 2). Although relatively new, the CBC became clogged during a recent storm event causing an overflow of water and sandy bed materials across Northshore Road. This action is needed for reasons of safety, park operations and economics, and resource management.

An environmental assessment (EA) analyzes the proposed action and alternatives and their potential impacts on the environment. This EA has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), and its implementing regulations published by the Council on Environmental Quality (40 *Code of Federal Regulations* (CFR) 1500-1508) and NPS Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*.
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RECREATION AREA PURPOSE, SIGNIFICANCE, AND MISSION

An essential part of the planning process is understanding the purpose, significance, and mission of the recreational area for which the EA is being prepared. A description for each of these legislative mandates is presented herein.

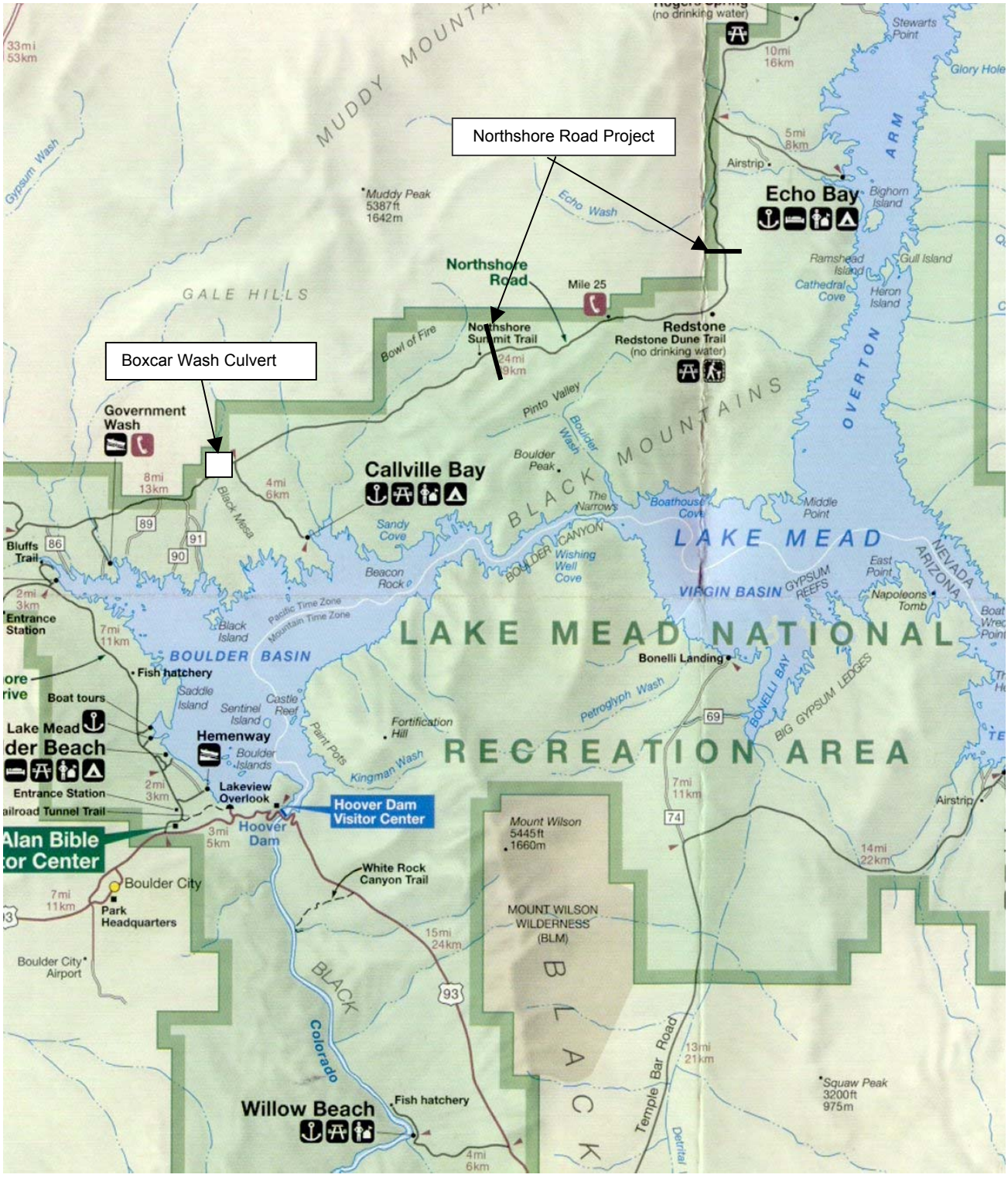

FIGURE 1. REHABILITATE NORTHSHORE ROAD PROJECT SITE

FIGURE 2. CULVERT IN BOXCAR WASH, DOWNSTREAM SIDES OF NORTHSHORE ROAD

Recreation Area Purpose

The purpose of Lake Mead NRA is to:

> *Provide public recreation, benefit, and use in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and preserve the scenic, historic, scientific, and significant features of the area (NPS 2000b).*

Recreation Area Statement of Significance

The significance of Lake Mead NRA:

> *Lake Mead NRA is the premiere inland water recreation area in the West with 1.5 million surface acres, including 700 miles of shoreline on Lakes Mead and Mohave. It represents superlative examples of the plants, animals, and physical geography of the Mojave Desert, Colorado Plateau, and Basin and Range geologic provinces. The park includes many regionally and nationally significant natural resource components, including populations of federally listed threatened and endangered species of animals, birds, fish, and plants. The area also represents a continuum of cultural resources from prehistoric to historic sites, including several culturally sensitive areas with sacred and traditional significance to contemporary American Indians.*

Lake Mead NRA provides a wide variety of unique outdoor recreation opportunities ranging from warm-water recreation to exploration of rugged and isolated backcountry, making it a wilderness park in an urbanizing setting. The area generates over $500 million directly for the local economy. Lake Mead NRA serves as a major focus in the western United States for public outdoor water recreation, which is at a premium in this desert environment. The area is within a day's drive of 20 million people in the Los Angeles Basin and 2.7 million people in the Phoenix metropolitan area. Lake Mead is also within a 20-minute drive of 1.1 million people in the Las Vegas Valley, with up to 6,000 new residents per month and 30 million visitors per year, making Las Vegas one of the fastest-growing communities and tourism destinations in the country (NPS 2000b).

Recreation Area Mission

The mission of Lake Mead NRA is to:

Provide diverse inland water recreational opportunities in a spectacular desert setting for present and future generations (NPS 2000b).

PROJECT BACKGROUND, PREVIOUS PLANNING, SCOPING, AND VALUE ANALYSIS

Project Background

The segment of Northshore Road considered for rehabilitation and reconstruction begins at MP 20.8 and ends at MP 30.3. The proposed action represents one phase of a long-term rehabilitation project for the entire length of Northshore Road within the boundaries of Lake Mead NRA. Northshore Road is typically 24-feet wide and paved, with centerlines, shoulder lines, and 4-foot-wide gravel shoulders. The shoulder areas have been graded along both sides of the road to allow turnouts and guide drainage. The posted speed limit on the route is 35 to 50 miles per hour. Traffic volume data from NPS Count Station 1911 on Northshore Road show that average annual daily traffic (AADT) on the route was approximately 350 vehicles per day in 1993 (Robert Peccia and Associates, Inc. 1995).

During 1995, the National Park Service conducted a Traffic Safety Program Review for roads within Lake Mead NRA (Robert Peccia and Associates, Inc. 1995). From 1991 through 1993, the segment of Northshore Road between Callville Bay Road and Echo Bay Road had the second-highest number of accidents for a monitored road segment in Lake Mead NRA (Robert Peccia and Associates, Inc. 1995). The most apparent driver error on Northshore Road is that of excessive speed. Speeding is a particular problem for vehicles towing trailers as motorists may have difficulty negotiating curves on the route. Recommendations in the report include road reconstruction to 32-feet wide (two 12-foot travel lanes and two 4-foot shoulders) to increase safety for the driving public.

Paved shoulders were considered necessary because existing pavement edges were deteriorating from passing wide-tracking vehicles such as boat trailers. The resulting condition includes structural damage to the pavement, need for constant maintenance, and hazard creation for motorists who could drop a wheel in the rut or ditch formed at the road edge (figure 3). Other recommended improvements included improved wash crossings, minor realignments at dangerous curves, use of guardrails in hazardous areas, and installation of reflective delineators for night driving safety.

FIGURE 3. EXAMPLE OF ROAD EDGE

During a 2002 storm event, the Boxcar Wash CBC at MP 10.5 became clogged, causing water and sand to overflow Northshore Road. The floodwaters deposited sand and debris on the road and caused erosion on the south embankment (see figure 2). Storm events in 1994 and 1998 also overwhelmed the Boxcar Wash CBD and damaged (partially washed out) the road. Construction of the CBC was a major portion of the previous phase of road improvements on Northshore Road, but a recent hydrology study concluded that the culvert design for a 10-year event was inadequate (PBS&J 2003).

Previous Planning

The proposed Northshore Road rehabilitation and reconstruction project complies with the primary management objectives for Lake Mead NRA as stated in the approved *General Management Plan* (1986). *General Management Plan* management objectives include accommodation of increased visitor use while protecting Lake Mead NRA's most outstanding natural and cultural resources. The *General Management Plan* also calls for rehabilitation and other improvements to Northshore Road extending to the northern park boundary.

The 2002 *Lake Management Plan / Final Environmental Impact Statement* for the management of water-based recreation within Lake Mead NRA describes and analyzes four alternatives for improving the management of Lakes Mead and Mohave to provide for the long-term protection of park resources while allowing a range of recreational opportunities for park visitors. Under the preferred alternative of the management plan (alternative C), facility expansion could occur at Callville Bay, Echo Bay, Overton Beach, and Temple Bar on Lake Mead. Expansion of facilities would increase traffic to these lake destinations served by Northshore Road.

A hydrological analysis was conducted to determine proper engineering of a 10-foot x 10-foot CBC in Boxcar Wash, west of the Callville Bay Road intersection with Northshore Road (approximately MP 10.5) and the culverts on this segment of Northshore Road. Recommendations from the hydrologic study for the correction of identified drainage concerns include:

- adding a second 10-foot x 10-foot CBC in Boxcar Wash, and
- upgrading 15 undersized culverts by replacing the existing pipe or adding an additional pipe to meet the American Association of State Highway and Transportation Officials design guidelines for a 50-year or larger storm event.

Scoping

Scoping is an effort to involve agencies and the general public in determining issues to be addressed in this EA. Scoping is used to determine important issues to be given detailed analysis in the EA and eliminate issues not requiring detailed analysis; allocates assignments among the interdisciplinary team members and/or other participating agencies; identifies related projects and associated documents; identifies permits, surveys, consultations, etc. required by other agencies; and creates a schedule that allows adequate time to prepare and distribute the EA for public review and comment before a final decision is made. Scoping includes any interested agency, or any agency with jurisdiction by law or expertise (including the State Historic Preservation Office (SHPO) and American Indian tribes) to obtain early input.

Staff of Lake Mead NRA and resource professionals of the National Park Service Denver Service Center conducted internal scoping. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined the likely issues and impact topics, and identified the relationship of the proposed action to other planning efforts at Lake Mead NRA.

A press release initiating scoping and describing the proposed action was issued on 7 November 2002. Comments were solicited during a public scoping period that ended 7 December 2002. No comments were received. An onsite informal consultation with U.S. Fish and Wildlife Service was held 18 December 2002. The public and American Indian groups traditionally associated with the lands of Lake Mead NRA will also have an opportunity to review and comment on this EA.

ISSUES AND IMPACT TOPICS

Issues

Issues and concerns affecting this proposed action were identified from past NPS planning efforts, and input from individuals, environmental groups, and state and federal agencies. The major issues are the conformance of the proposed action with the *Lake Management Plan* (2002) and *General Management Plan* (1986) and potential impacts to biotic communities, threatened and endangered species and other species of concern, floodplains and water quality, visitor use and experience, air quality, soils, and health and safety.

Derivation of Impact Topics

Specific impact topics were developed for discussion focus and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal law, regulations, and Executive Orders; 2001 *NPS Management Policies*; and NPS knowledge of limited or easily impacted resources. A brief rationale for the selection of each impact topic is given below, as well as a rationale for dismissing specific topics for further consideration.

Impact Topics Selected for Detailed Analysis

Biotic Communities. NEPA calls for an examination of the impacts on all components of affected ecosystems and is the charter for the protection of the environment. NEPA requires federal agencies to use all practicable means to restore and enhance the quality of the human environment and to avoid and minimize any possible adverse effects of their actions upon the environment. NPS policy is to protect the components and processes of naturally occurring biotic communities, including the natural abundance, diversity, and ecological integrity of plants and animals (*NPS Management Policies* 2001a). The proposed action has the potential to affect biotic communities; therefore, this impact topic is addressed in detail in the EA.

Threatened and Endangered Species and Species of Concern. The Endangered Species Act (1973), as amended, requires an examination of impacts on all federally listed threatened or endangered species. NPS policy also requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. Such species could be affected by the proposed action; therefore, this impact topic is addressed in the EA.

Floodplains and Water Quality. Executive Order 11988 (*Floodplain Management*) requires an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains. *NPS Management Policies*, Director's Order−2 (*Planning Guidelines*), and Director's Order−12 (*Conservation Planning, Environmental Impact Analysis, and Decision-making*) provide

guidelines for proposed actions in floodplains. The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters, to enhance the quality of water resources, and to prevent, control, and abate water pollution. *NPS Management Policies* provide direction for the preservation, use, and quality of water in national park units. Floodplains and water quality could be affected by the proposed action; therefore, this impact topic is addressed in the EA.

Air Quality. The 1963 Clean Air Act, as amended (42 *United States Code* (USC) 7401 *et seq*.), requires land managers to protect air quality. Section 118 of the Clean Air Act requires parks to meet all federal, state, and local air pollution standards. *NPS Management Policies* address the need to analyze potential impacts to air quality during park planning. Lake Mead NRA is classified as a Class II air quality area under the Clean Air Act, as amended. The proposed action has the potential to affect air quality; therefore, this impact topic is addressed in the EA.

Soils. Since the proposed action involves ground-disturbing activities on previously undisturbed desert soil, soils are addressed as an impact topic in the EA.

Visitor Use and Experience. Short-term effects to visitor use and experience would be expected during project construction in the form of traffic delays. Since construction activities could affect visitor use and experience on Northshore Road and at Boxcar Wash; therefore, this topic is addressed in the EA.

Health and Safety. Public safety and worker safety could potentially be affected by selection of either alternative; therefore, health and safety is addressed as an impact topic in this EA.

Impact Topics Dismissed From Detailed Analysis

Cultural Resources. Cultural resources include archeological resources, ethnographic resources, historic structures, and cultural landscapes. Over 1000 archeological sites are believed to be within the park boundaries, unfortunately, less then 5% of park lands has been systematically surveyed for archeological sites. Over 40 historic structures have been documented and are included on the park's List of Classified Structures. To date, 22 cultural landscapes have been identified and several ethnographic resources, referred to as traditional cultural properties, are known to exist within Lake Mead NRA.

Numerous legislative acts, regulations, and NPS policies provide direction for the protection, preservation, and management of cultural resources on public lands. Further, these laws and policies establish what must be considered in general management planning and how cultural resources must be managed in future undertakings resulting from the approved plan, regardless of the final alternative chosen. Applicable laws and regulations include the NPS Organic Act (1916), the Antiquities Act of 1906, the National Historic Preservation Act of 1966 (1992, as amended), the National Environmental Policy Act of 1969, the National Parks and Recreation Act of 1978, the Archeological Resources Protection Act of 1979, the Native American Graves Protection and

Repatriation Act of 1990, and the Curation of Federally Owned and Administered Archeological Collections (1991). Applicable agency policies relevant to cultural resources include Chapter 5 of *NPS Management Policies*, and the *Director's Order 28: Cultural Resource Management*, as well as other related policy directives such as the NPS *Museum Handbook*, the NPS *Manual for Museums*, and *Interpretation and Visitor Services Guidelines (NPS-26)*.

Cultural resource inventories have been completed in the area of potential effect for this project, which includes the Boxcar Wash area (Daron 1999) and a corridor from milepost 20.8 through 30.3 (Guisto 2003). No cultural resources were located in the area of potential effect for this project.

Should unknown cultural resources be encountered during construction activities, work would be halted in the discovery area and the park would consult according to 36 CFR 800.13, and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990.

Indian Trust Resources. Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in Lake Mead NRA. The Secretary of the Interior, for the benefit of Indians, does not hold the lands comprising Lake Mead NRA in trust due to their status as Indians. Therefore, Indian trust resources were dismissed as an impact topic.

Wetlands. Executive Order 11990 (*Protection of Wetlands*) requires an examination of impacts to wetlands. There are no jurisdictional or NPS-defined wetlands within the project area. Therefore, wetlands were dismissed as an impact topic.

Prime and Unique Farmlands. In 1980, the Council on Environmental Quality directed federal agencies to assess the effects of their actions on farmland soils classified as prime or unique by the United States Department of Agriculture, Natural Resources Conservation Service. Prime or unique farmland is defined as soil, which particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. There are no prime or unique farmlands associated with the project area; therefore, this topic was dismissed from detailed analysis.

Ecologically Critical Areas, Wild and Scenic Rivers, Other Unique Natural Areas. No areas within Lake Mead NRA have been designated as ecologically critical, nor are there any existing or potential Wild and Scenic Rivers within Lake Mead NRA. Lake Mead is an important natural area, but the proposed action would not threaten the associated qualities and resources that make Lake Mead NRA unique. This topic was, therefore, dismissed from detailed analysis.

Environmental Justice. Executive Order 12898 (*General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)*, requires all agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. No alternative under consideration would have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's *Draft Environmental Justice Guidance* (July 1996). Environmental justice was, therefore, dismissed from detailed analysis.

Park Operations. Effects on park operations from the proposed action would be negligible. Increased staff or additional equipment would not be required, nor would additional maintenance activities. Therefore, park operations have been dismissed as an impact topic.

Scenic Resources. In an evaluation of scenic quality, both the visual character and visual quality of a view shed are considered. A view shed comprises the limits of the visual environment associated with the proposed action. Northshore Road has been operational for over 30 years, and the proposed action does not relocate or expand the road. During construction, effects would result from the presence of temporary desert tortoise fence, construction equipment, and dust, but they would be short term and occur within the existing road corridor. Therefore, this topic was dismissed from detailed analysis.

Soundscapes. In accordance with *NPS Management Policies* (2001) and Director's Order−47: *Sound Preservation and Noise Management*, an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. Noise associated with road improvements would be short term and localized, and construction activities would be scheduled so as to minimize effects on visitor experience. Road improvements would not result in a measurable increase in traffic noise; therefore, this topic was dismissed from detailed analysis.

Lightscapes. In accordance with *NPS Management Policies* (2001), the National Park Service strives to preserve natural ambient landscapes, which are natural resources, and values that exist in the absence of human-caused light. Lightscapes would not be affected by the proposed action; therefore, this topic was dismissed from detailed analysis.

Socioeconomics. Neither the no-action or preferred action alternative would change local or regional land use or transportation, nor would it appreciably affect local businesses outside Lake Mead NRA. Implementation of the preferred action could provide a negligible beneficial impact to the economies of Boulder City, Henderson, or Las Vegas (e.g., increased employment opportunities

for the construction work force and revenues for local businesses and government related to construction activity). The duration of construction activity for the preferred alternative is nine months to one year. Benefits to the local economy would be temporary, lasting only during construction, and negligible overall. In addition, improvements on Northshore Road would not affect concessions within the park. Therefore, socioeconomics was dismissed from detailed analysis.

PREFERRED ALTERNATIVE AND OTHER ALTERNATIVES

INTRODUCTION

This section describes two alternatives (A and B) for improvements of Northshore Road and the CBC at Boxcar Wash at Lake Mead NRA. Alternatives were developed to resolve issues with safety, deteriorated road surface, and inadequate drainage infrastructure.

NO-ACTION ALTERNATIVE

The no-action alternative refers to a continuation of existing conditions on Northshore Road and the Boxcar Wash CBC without implementation of the preferred action. Deficiencies identified for the road include deteriorating pavement, inadequate drainage, short sight distances, narrow lanes, and sharp curves. The Boxcar Wash CBC is currently designed for a 10-year storm event. Deficiencies in the Boxcar Wash CBC may produce increased erosion of fill material supporting Northshore Road and pose a road overflow safety hazard to motorists during flood events. The no-action alternative does not preclude short-term, minor improvement activities on the road (e.g., limited safety and drainage improvements or fixing potholes and grading shoulders) that would be part of routine maintenance for continuing operations of Northshore Road.

Consideration of the no-action alternative is prescribed by Council on Environmental Quality regulations and serves as a benchmark for comparing the management direction and environmental consequences of the preferred alternative. Should the no-action alternative be selected, Lake Mead NRA would respond to future needs and conditions associated with the roadway without major actions or changes from the present course.

PREFERRED ALTERNATIVE

The preferred alternative presents the NPS proposed action and defines the rationale for the action in terms of resource protection and management, visitor and operational use, and costs. The preferred alternative meets the Lake Mead NRA planning objective of improving motorist safety and managing resources on and along Northshore Road.

ROADWAY IMPROVEMENTS, NORTHSHORE ROAD, MP 20.8 – 30.3

Under the preferred alternative, the entire segment of Northshore Road under consideration would be rehabilitated, while a short segment would be reconstructed (figure 4). Rehabilitation and reconstruction would provide the conditions and service life associated with a new road.

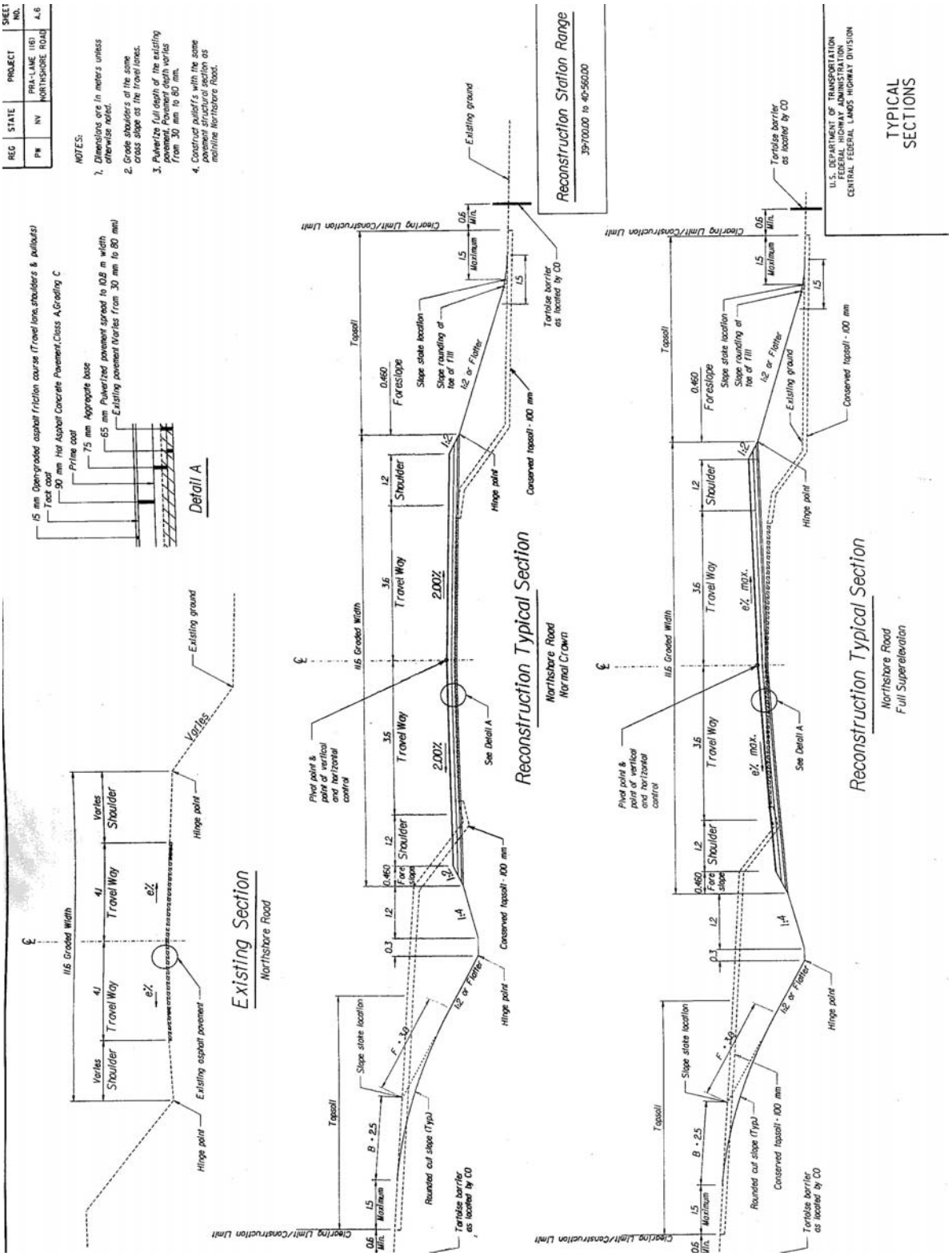

FIGURE 4. NORTHSHORE ROAD SEGMENT TO BE RECONSTRUCTED

Rehabilitation

This part of the preferred alternative refers to rehabilitation of the existing alignment and bench of Northshore Road MP 20.8 to MP 24.7, and MP 25.3 to MP 30.3. The section of road between MP 24.7 and MP 25.3 would be reconstructed partially off the existing alignment and bench. The rehabilitation is intended to improve poor pavement conditions, rehabilitate deteriorated and inadequate drainage infrastructure, and provide adjustments to the existing alignment between MPs 24.7 and 25.3. New traffic control and informational signs would be installed. The roadway would be rehabilitated on the existing road bench to an average width of 32 feet, as is currently present. The 32-foot road width would include two 12-foot-wide paved travel lanes and two 4-foot-wide paved shoulders. Curves would be widened by 3 feet (total curve width 35 feet) in high-accident locations. Some horizontal and vertical alignment would be adjusted to improve safety.

Rehabilitation would improve the roadway within the existing alignment, and would include recycling a portion of the existing roadway surface and base; laying, leveling, and compacting this material; and applying a 3-inch asphaltic concrete overlay. Subexcavation of unsuitable subgrade material and backfill with free draining subbase would be performed in selected locations, as needed. Twelve-inch-wide scored chatter strips would be placed on the road shoulder along and outside the fog line (painted line along the road edge). This would provide a 3-foot-wide strip of smooth pavement for the safe movement of bicycle traffic.

The guardrail at MP 25.2 would be removed and a traversable ditch would be created. The guardrail at MP 25.6 would be left in place for resource protection.

Reconstruction

The portion of Northshore Road between MPs 24.7 and 25.3 would be reconstructed. This road segment contains three curves and a parking lot with call box (telephone). The radii of the existing curves are 550 feet and 650 feet. The existing vertical alignment and tight curves create short sight distances and a safety hazard for motorists turning into the parking lot. Reconstruction would be comprised of increasing the curve radii to 700 feet and adding turn lanes into the parking lot (discussed below). Curves would be widened by 3 feet (total curve width 35 feet) in high accident locations. Some horizontal and vertical alignment would be adjusted to improve safety. The road width would also be increased to 32 feet in non-curve segments, as previously described.

Proposed Turnouts and Parking Lots

There are currently eight turnouts along Northshore Road between MPs 20.8 and 30.3. Some turnouts are located on curves, creating hazards for motorists re-entering the road. All turnouts will be formalized with curb and gutters, and be approximately one-lane-width (12 feet) wide. Under the preferred alternative, one turnout at MP 24.6 would be removed to eliminate safety hazards.

The traffic configuration at Redstone parking area would be changed to improve circulation for buses and improve parking. The new parking lot would be formalized with curb and gutters, and sidewalks would be added. The new construction would occur within the area of previous disturbance.

At the call box parking lot (also known as Broadview parking area) (MP 24.9), a left-turn lane would be added for eastbound traffic, and a right-turn lane would be added for westbound traffic. The sight distances are short in this area, and the turn lanes would improve circulation for vehicles entering the parking lot. The parking lot would remain in its current configuration, and construction would occur within the existing footprint.

Construction Staging Area

Staging areas would be located at an old borrow pit, approximately one-quarter mile north of Northshore Road, on Bitter Springs Road. Other areas include the call box parking lot (also known as Broadview parking area), a parking area near the intersection of Northshore Road and Callville Bay Road at the southern end of the project, and at the Redstone Scenic Area parking lot near the northern end of the project. Several existing turnouts would serve as temporary storage sites for desert soil. Aggregate and paving materials would be acquired from local sources outside Lake Mead NRA.

Culverts

There are currently 18 culverts along Northshore Road between MPs 20.8 and 30.3. Only three of these culverts meet American Association of State Highway and Transportation Officials' (AASHTO) design guidelines for a 50-year or larger storm event. Fifteen culverts are undersized and would be doubled in size, either by replacing the existing pipe with a larger diameter pipe or by adding an additional pipe. Every culvert would also have riprap placed at the inlet and outlet to control erosion, and would also have colored concrete head walls installed to blend with the surrounding landscape.

The Boxcar Wash CBC currently consists of one 10-foot concrete box, and is designed for a 10-year storm incident. A recent storm event sent water and debris over the top of the roadway. Under the preferred alternative, a second 10-foot CBC would be added in the wash. Traffic at Boxcar Wash CBC would be detoured into the wash around the site during construction. Excess soil from the curve realignment at MPs 24.7 and 25.3 would be imported to the site to construct the detour lanes.

Project Timing

The Northshore Road and Boxcar Wash CBC rehabilitation project would begin in winter of 2004 and would be scheduled for completion in the spring of 2005. Northshore Road, between MPs 20.8 and 30.3 and at MP 10.5, would remain open during construction, but traffic control would be

required and delays of up to 15 minutes could occur. Construction would not be permitted on holiday weekends unless the Lake Mead NRA superintendent provided advanced approval.

MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

Mitigation measures were identified for implementation of the preferred alternative, rehabilitation of Northshore Road and the Boxcar Wash CBC, in order to lessen or eliminate potential adverse effects. The following section addresses proposed mitigation for a number of impact topics.

Visitor Safety and Experience

During rehabilitation and restoration activities, Lake Mead NRA visitors would be routed around or away from construction areas. Barricades would be placed around construction areas to prevent visitor entry. If necessary, Northshore Road would be closed for brief periods up to 15 minutes. Signs would be posted notifying visitors of delays.

The potential for flash flooding is present during the monsoon season (between July and September) and poses a safety threat to visitors at the Boxcar Wash CBC. Therefore, construction during the monsoon season would be avoided. If project work were to occur during this time period, a safety plan for work in desert washes would be formulated and implemented.

Worker Safety

The potential for flash flooding is present between July and September and poses a safety threat to construction workers. Therefore, construction during the monsoon season would be limited. If project work were to occur during this time period, a safety plan with provisions to reduce worker vulnerability to flash floods would be formulated and implemented. The contractor would be required to prepare a Flash Flood Emergency Plan.

Site Clearing and Grubbing

Construction area boundaries for the project area would be clearly marked with ribbons and stakes prior to initiating ground-disturbing activity. No disturbance would be permitted beyond these limits. Temporary construction fencing would be installed where deemed necessary by the Federal Highway Administration and NPS project coordinators.

Scenic Resources

Improvements on Northshore Road and at Boxcar Wash CBC would require the following in order to protect scenic resources: limiting the road corridor for a safe driving experience to the minimum;

matching the design and color of construction materials with natural surroundings; and possibly treating rocks damaged during construction and exposed culvert ends or flared end sections with Permeon, or a similar approved treatment method, in order to match local soil colors and reduce disturbance visibility to visitors.

Water Quality, Air Quality, and Noise Abatement

Erosion control measures would be applied during construction to minimize minor and short-term impacts to water quality. Sediment traps, erosion check structures, and/or filters would be considered for mitigation purposes.

Best management practices, as identified and utilized by the National Park Service, include preventing or reducing nonpoint source pollution and minimizing soil loss and sedimentation in drainage areas. Use of best management practices in the project area for drainage area protection would include all or some of the following actions, depending on site-specific requirements:

- Locating waste and excess excavated materials outside of washes to avoid sedimentation;
- Installing silt fences, temporary earthen berms, temporary water bars, sediment traps, stone check dams, or other equivalent measures (including installing erosion-control measures around the perimeter of stockpiled fill material), prior to construction;
- Conducting regular site inspections during the construction period to ensure that erosion-control measures were properly installed and are functioning effectively;
- Storing, using, and disposing of chemicals, fuels, and other toxic materials in a proper manner; and
- Refueling construction equipment only in upland areas to prevent fuel spills near water resources.

During the work effort, and for a time following project completion, the amount of airborne particulates would increase in and around the area of construction. To minimize impacts to air quality, fugitive dust plumes would be suppressed using water sprinkling during earth-disturbing activities. Water used to preserve air quality during construction would be pumped from Lake Mead and hauled by truck to the construction site.

Concrete and batch plants would be located outside Lake Mead NRA. It is expected that the project contractor would use existing commercial sources of concrete and asphalt.

Contractors would be required to use state-of-the-art noise reduction technology on construction equipment to the maximum extent possible.

Biotic Communities

For most of the road corridor, revegetation would not be necessary since construction would occur in areas previously disturbed by the roadway template. Revegetation work would require the

contractor to place desert soil, conserved during construction, along the corridor. The park would be responsible for spreading seeds from native species (genetic stocks originating in Lake Mead NRA). Revegetation efforts would attempt to reconstruct the natural spacing, abundance, and diversity of native plant species.

In an effort to avoid introduction of exotic/noxious plant species, no imported topsoil (desert soil) or hay bales would be used during revegetation.

Undesirable plant species would be controlled in high-priority areas and other undesirable species would be monitored and controlled, as necessary. To prevent the introduction of, and minimize the spread of exotic vegetation and noxious weeds, the following measures would be implemented during construction:

- Minimizing soil disturbance;
- Pressure wash and/or steam clean all construction equipment to ensure that all equipment, machinery, rocks, gravel, or other materials are cleaned and weed free before entering Lake Mead NRA;
- Limiting vehicle parking to existing roadways, parking lots, or the access routes;
- Roadsides and culvert areas should receive as little disturbance as possible, including limiting equipment to the roadbed area; no machinery or equipment should access areas outside the construction zone;
- Obtaining all fill, rock, or additional topsoil from the project area;
- Initiating revegetation of disturbed sites immediately following construction activities;
- NPS biologists would monitor disturbed areas for up to three years following construction to identify growth of noxious weeds or exotic vegetation. Treatment of exotic vegetation will be completed in accordance with NPS-13, *Integrated Pest Management Guidelines*. (In 2003, Lake Mead NRA will be developing an Exotic Vegetation Management Plan to address specifics and analyze alternatives related to the control of noxious weeds and exotic vegetation.);
- Salvaging and storing desert soils and gypsum soils separately, replacing them as close as possible to their original locations and ensuring they are not pushed off edges of roadsides or dumped on roadsides; and
- Obtaining cleaned riprap from sources outside Lake Mead NRA.

Desert soil would be stored on or as near to its original location as possible to minimize impacts on vegetation and the potential for compaction and erosion of bare soils. Approximately 654-cubic yards (500-cubic meters) of salvaged desert soil would be stored at the construction staging area. Replacement of desert soil would include spreading, seeding, and/or planting species native to the immediate area. When necessary, desert soil replacement techniques would be used to re-establish desert crust surfaces and minimize impacts from invasive plant species, such as Russian-thistle (*Salsola tragus*), that often become established on disturbed soils along the roadway. (Previous revegetation efforts in Lake Mead NRA indicate that certain exotic species, such as Russian-thistle, may grow in newly placed desert soils for the first two to three years of vegetation re-establishment; then they tend to disappear.)

To maximize vegetation restoration efforts after completion of construction activities, the following measures would be implemented:

- Salvaging topsoil from access route construction for reuse during restoration on disturbed areas;
- Salvaging native vegetation for subsequent replanting in disturbed areas; and
- Monitoring revegetation success for up to three years following construction and implementing remedial and control measures as needed.

Cultural Resources

Should unknown archeological resources be uncovered during construction, work would be halted in the discovery area, the site secured, and Lake Mead NRA would consult according to 36 CFR 800.13 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990. In compliance with the Native American Graves Protection and Repatriation Act of 1990, the National Park Service would also notify and consult concerned tribal representatives for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the project.

Threatened and Endangered Species

The Desert Tortoise

During the informal consultation process between the National Park Service and the U.S. Fish and Wildlife Service (USFWS) (Hendricks pers. comm. 2002), the USFWS identified three potential impacts from the proposed project on the desert tortoise (*Gopherus agassizii*), including: (1) construction and road widening impacts, (2) impacts related to increased speed following rehabilitation of the roadway, and (3) covering over desert wash habitat and removing caliche layers and caves for tortoise habitation.

Mitigation measures to be implemented to further minimize adverse effects to the desert tortoise during construction, and designed to reduce habitat loss, degradation, and fragmentation; direct mortality from construction activity; and common raven (*Corvus corax*) predation include:

- Lake Mead NRA resource management staff would oversee the installation of temporary desert tortoise fencing (figure 5) along both sides of Northshore Road for the entire length of the project corridor to deter individuals from crossing the construction zone. The fence would act as a drift fence to direct desert tortoises through culverts under the road and allow access to habitat on both sides of the road.

FIGURE 5. TEMPORARY DESERT TORTOISE FENCING (WOULD BE SIMILAR TO PERMANENT FENCING)

- The clearing limits (construction limits) on the edge of the existing road prism would be clearly marked or flagged prior to construction. All construction activities, including staging areas, would be located within previously disturbed areas and fenced, if necessary.

- Use of qualified and authorized biologists for all activities within the roadway corridor. An individual will be designated the field contact representative to oversee project compliance and coordination.

- All new culverts installed would be a minimum of 30-inches in diameter, providing adequately sized passageways for the desert tortoise.

- Survey of the project area by an NPS-qualified biologist for desert tortoises and their burrows and dens, immediately prior (within 24 hours) to the onset of construction in any given area. The results of the surveys would be to remove all desert tortoises currently on the project site and identify all burrows that may be avoided during construction. A qualified or authorized biologist would perform all desert tortoise surveys, handling desert tortoises, and excavating burrows.

- Desert tortoise burrows found within the project area would be avoided, if possible. They would be protected with desert tortoise-proof fence placed at a minimum of 20 feet from the burrow, on sides bordered by construction, to prevent crushing of underground portions of the burrow. The fencing would remain in place until construction in the vicinity was completed. Placement, inspection, and removal of fencing would occur under the direction of an NPS-qualified biologist.

- Desert tortoise burrows found within the project area that could not be avoided during construction, would be excavated by hand to determine if the burrows were occupied and to remove any desert tortoises present. All desert tortoises found within the project area,

whether above ground or in excavated burrows, would be placed 300 to 1,000 feet outside of the clearing limits in the direction of undisturbed habitat. Handling and placement of desert tortoises would be performed in accordance with procedures identified in consultation with the USFWS. NPS biologists would be consulted prior to construction to determine the best time of year for excavation of burrows and relocation of desert tortoises.

- The contractor would be required to put construction fence around all excavations, holes, or deep depressions, as necessary to protect against intrusion by the desert tortoise at sites with potential hazards.

- Construction personnel would be informed of the occurrence and status of the desert tortoise and would be advised of the potential impacts to desert tortoises and potential penalties for taking a threatened species. Following training of project staff, each trained individual would sign a completion sheet to be placed in file at Lake Mead NRA.

- A litter control program would be implemented during construction to eliminate the accumulation of trash, which would attract common ravens that may prey on juvenile desert tortoise. Trash would be removed to trash containers following the close of each workday and disposed outside Lake Mead NRA in a sanitary landfill at the end of each workweek.

- Approximately 0.27 acre of upland desert tortoise habitat, disturbed by historic construction (existing turnouts, road shoulders) and maintenance activities, would be revegetated and surface reclamation of the disturbed areas would be performed to advance recovery of the habitat. At a minimum, desert soil salvage, rocks, and plants; recontouring disturbed sites; replacement of desert soil, surface armor rock, and large rocks; seeding and planting with native species; and application of a chemical weathering agent to replicate the natural coloring of the surface layer would be considered.

Rare or Sensitive Vegetation

The primary means of preserving individual species (Las Vegas bearpoppy (*Arctomecon californica*), threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*), sticky buckwheat (*Eriogonum viscidulum*), Sweet trichostomum (*Trichostomum sweetii*), seriate crossidium (*Crossidium seriatum*), and Gold Butte moss (*Didymodon nevadensis*)) would be through the salvage and replacement of desert soil to preserve seeds that may be present.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

According to Council on Environmental Quality regulations implementing NEPA, and the National Park Service NEPA Guidelines (Director's Order−12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*), an environmentally preferred alternative must be identified in environmental documents, including EAs. In order for an alternative to be environmentally preferred, it must meet the criteria established in NPS policies and guidance documents. An

alternative must meet the following criteria to be considered an environmentally preferred alternative:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The no-action alternative only meets criterion 4. The environmentally preferred alternative in this EA is the NPS preferred alternative. This alternative was selected based on the following criteria:

- Preventing loss of natural resources (NEPA Criteria 1, 3, and 4);
- Protecting public health, safety, and welfare (NEPA Criteria 2 and 3);
- Improving operations efficiency and sustainability (NEPA Criteria 1, 3, and 6); and
- Protecting employee safety and welfare (NEPA Criteria 3).

In short, the preferred alternative provides for protection of public and employee health, safety, and welfare; improves day-to-day operations at Lake Mead NRA; and also provides protection for the federally listed threatened desert tortoise and the state-listed Las Vegas bearpoppy.

Sustainability

The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design NPS facilities to:

- minimize adverse effects on natural and cultural values,
- reflect their environmental setting,
- maintain and encourage biodiversity,
- construct and retrofit facilities using energy-efficient materials and building techniques,
- operate and maintain facilities to promote their sustainability, and
- illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use.

Essentially, sustainability is living within the environment with the least impact on the environment. The preferred alternative subscribes to and supports the practice of sustainable planning, design, and use of the road and associated public and administrative facilities serviced by it through mitigation, preparation, design, and materials.

PERMIT AND CONSULTATION REQUIREMENTS

For the no-action alternative, no permits would be required.

The NPS preferred alternative, would comply with Executive Order 11988 (*Floodplain Management*) and the Fish and Wildlife Coordination Act of 1934, Public Law (PL) 85-624, as amended (16 USC subsection 661 – 666c). The following approvals and permits from jurisdictional agencies would be required before the preferred alternative could be implemented:

- U.S. Army Corps of Engineers, Nationwide or Individual Permit (as appropriate), pursuant to section 404 of the Clean Water Act, for minor discharges of dredged or fill material in waters of the United States.

- Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Water Quality Planning, Water Quality Certification, pursuant to section 401 of the Clean Water Act.

- Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Water Pollution Control, General Rolling Stock Permit for operating equipment in a body of water.

- Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Water Pollution Control, General Construction Stormwater Permit for authorization to discharge stormwater associated with construction activity under the National Pollutant Discharge Elimination System.

- U.S. Fish and Wildlife Service, consultation regarding threatened and endangered species, in compliance with section 7 of the Endangered Species Act of 1973, as amended.

- Clark County Health District, Air Pollution Control Division – Dust-control permit for construction activities, including surface grading and trenching.

ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

One alternative considered was rehabilitation of Northshore Road, MP 20.8 – 30.3, without reconstructing the curves. This option was eliminated from detailed analysis because it does not fully address the safety concerns on this segment of roadway.

COMPARATIVE SUMMARY OF NO-ACTION AND PREFERRED ALTERNATIVES

TABLE 1. COMPARATIVE SUMMARY OF ALTERNATIVES

No-Action Alternative	Preferred Alternative
There would be no improvements to Northshore Road between MP 20.8 and 30.3 or to the Boxcar Wash CBC on Northshore Road at MP 10.5. Lake Mead NRA managers would respond to future roadway and CBC needs without implementing actions beyond normal maintenance or altering the present status of the roadway or Boxcar Wash CBC.	To improve safety conditions for motorists, Northshore Road would be rehabilitated between MPs 20.8 and 30.3 to improve poor pavement conditions, and rehabilitate deteriorated and inadequate drainage infrastructure. The roadway would be widened on the existing road bench to accommodate two 12-foot paved travel lanes plus two 4-foot paved shoulders. One segment of the existing alignment between MPs 24.7 and 25.3 would be reconstructed to increase curve radii to 700 feet. Redstone parking lot would be re-configured to improve circulation. Turn lanes would be added to Northshore Road for improved access into the call box parking lot. One turnout would be removed, and others would be formalized. Culverts would be replaced, and curbs and gutters would be installed in several sections to guide stormwater runoff. A new CBC at Boxcar Wash would be installed adjacent to the existing CBC to meet current AASHTO standards for a 50-year storm event.

COMPARATIVE SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

TABLE 2. COMPARATIVE SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Potential Environmental Impacts		
Impact Topic	**No-Action Alternative**	**Preferred Alternative**
Biotic Communities	No change to alternative impacts to biotic communities.	Road reconstruction activities would have short-term, minor, adverse impacts on plant communities and wildlife.
Threatened and Endangered Species	Continued long-term, negligible to minor, adverse impacts to threatened and endangered species.	Short-term, negligible to minor, adverse impacts to desert tortoise, Gila monster, and chuckwalla could result from reduced population densities, alteration of movements, egg destruction, and intentional capture and movement of vulnerable individuals. Short-term, negligible, adverse impacts to other species of concern could result from habitat disturbance.
Floodplains and Water Quality	Continued long-term, local, negligible to minor, adverse impacts to floodplains and water quality.	The impact on floodplains and water quality would be negligible to minor, short-term, localized, and adverse. Upon completion, the effects to water quality would be long term, and slightly beneficial.
Air Quality	No impacts on air quality.	Air quality impacts from dust and construction equipment emissions would be short term, adverse, and minor.
Soils	No impacts to soils or geology.	Impacts to soils from road reconstruction would be long term, localized, adverse, and negligible in intensity. No unique or important geologic features would be affected.
Visitor Use and Experience	Continued negligible to minor, adverse impacts on visitor experience: motorists maneuvering tight curves and narrow roadway.	Short-term impacts on visitor use and experience would be minor and adverse if construction occurs during nonpeak visitation periods, as expected. If the project extends into peak season or weekends, impacts would be moderate. Long-term affects from road improvements would be beneficial in nature.
Health and Safety	Continued negligible to minor, adverse impacts on human health and safety from driving accidents.	Short-term health and safety impacts from reduced vehicle speed in construction zones would be slightly beneficial. Long-term impacts would be beneficial to motorists, resulting in improved sight distance, wider travel lanes, and safer roadway curves.

COMPARATIVE SUMMARY OF POTENTIAL LONG-TERM IMPACTS

TABLE 3. COMPARATIVE SUMMARY OF POTENTIAL LONG-TERM IMPACTS

Potential Long-Term Impacts		
Impact Topic	**No-Action Alternative**	**Preferred Alternative**
Biotic Communities	None	Minor, adverse
Threatened and Endangered Species	None	Negligible, localized, adverse
Floodplains and Water Quality	None	None
Air Quality	None	None
Soils	None	Localized, minor, adverse
Visitor Use and Experience	Negligible to minor, adverse impacts	Minor to moderately beneficial
Health and Safety	Negligible to moderate, adverse impacts	Moderately beneficial

AFFECTED ENVIRONMENT

Detailed information on resources of Lake Mead NRA can be found in Lake Mead NRA 1986 *General Management Plan* and in the 1999 *Resources Management Plan*. This section provides a description of Lake Mead NRA and identifies resources potentially affected by the Northshore Road and Boxcar Wash CBC rehabilitation project.

LOCATION AND GENERAL DESCRIPTION OF LAKE MEAD NATIONAL RECREATION AREA

Lake Mead NRA is located in southern Nevada and northwestern Arizona, approximately 20 miles southeast of Las Vegas, Nevada. Lake Mead NRA encompasses two large reservoirs (Lakes Mead and Mohave) formed by the Colorado River, which flows through Glen Canyon National Recreation Area and Grand Canyon National Park before reaching Lake Mead. The recreation area is about 1.5 million acres in size. About 60% of Lake Mead NRA is within the state of Arizona (Mohave County), and about 40% is within the state of Nevada (Clark County).

Rugged mountains, deep canyons, dry washes, and sheer cliffs are typical of the landscape that surrounds Lakes Mead and Mohave. Improved access to the lakeshores is limited. Northshore Road provides access to Callville Bay, Echo Bay, and Overton Beach developed areas along the western edge of Lake Mead. Lakeshore Road is the most heavily used road in the park and provides access to the Alan Bible Visitor Center, Boulder Beach, and Las Vegas Boat Harbor (Horsepower Cove) developed areas on the southwestern portion of Lake Mead. The developed areas are centered around marina activities and most have concessions services for overnight visitors and day users.

Lake Mead NRA lies in the Mojave Desert. Daily summer temperatures often rise well above 100 degrees Fahrenheit (°F). Temperatures are less extreme from October to May. Winter highs average 50°F. Precipitation is low, averaging 3 to 5 inches annually. Most precipitation is in the form of late summer thunderstorms that can cause flash floods. Air quality is generally good, but is sometimes degraded by the coal-fired Fort Mohave steam generating plant and airflows from the Las Vegas basin to the west.

Park Visitation

Lake Mead NRA is considered one of the premier water-based recreation areas in the nation. Annual NRA visitation was 8.8 million people in 2001, and has been relatively stable for the past five years (D. Melville pers. comm. 2002). Many recreation area visitors are involved in water-based recreational activities, primarily between May and September, which are supported at the developed marina / launch ramp areas. These activities include motor boating, house boating, sailboarding and sailing, canoeing, kayaking, rafting, water skiing, wakeboarding, fishing, swimming, SCUBA diving, use of personal watercraft, picnicking, boat touring, nature study, and camping along the lakeshore.

Visitors to Lake Mead NRA also participate in land-based activities, such as driving tours, hiking, and camping in NPS- or concession-operated campgrounds (NPS 2002c).

Lake Mead NRA is located in one of the fastest growing regions of the United States. Los Angeles, San Diego, and San Bernardino, California, are within a half-day drive, as is Phoenix, Arizona's largest metropolitan area. Many of Lake Mead's visitors reside in southern Nevada, Arizona, southern California, and southern Utah. However, nearby Las Vegas and Laughlin, Nevada, draw tourists from throughout the nation as well as international visitors; many visit Lake Mead NRA area while they are in the vicinity. The pressures of increasing visitation and regional population growth have created numerous challenges for the management of Lake Mead NRA and its resources.

Park Facilities and Operations

There are six marinas and nine paved launch ramps on Lake Mead, and three marinas and four paved launch ramps on Lake Mohave (NPS 2002c). The marinas include Lake Mead, Las Vegas Bay, Callville Bay, Echo Bay, Overton Beach, and Temple Bar on Lake Mead, and Willow Beach, Cottonwood Cove, and Katherine Landing on Lake Mohave. Boat ramps are located at Hemenway, Government Wash, and South Cove on Lake Mead, and Princess Cove on Lake Mohave. A variety of services are provided at the marina areas, including boat rentals, marina slips, dry boat storage, restaurants, stores, campgrounds, and lodging facilities.

Along this segment of Northshore Road, facilities include eight turnouts, a call box parking lot at MP 24.9 (Broadview parking area), and the Redstone parking lot at MP 30. The Redstone parking lot offers bus parking, restrooms, and a half-mile walking trail with views of the red-colored rock formations.

For Northshore Road, Lake Mead NRA staff conducts general maintenance activities, including routine and recurring work to repair or preserve the existing roadway and associated culverts. Routine maintenance activities include patching, applying chip-seal, striping, ditch cleaning / shaping, shoulder grading and stabilization, guardrail maintenance, signing, cleaning out debris, and adding riprap. There has been some repair of embankment sections where the toe of the slope is in a wash. Otherwise, there is no maintenance activity outside the existing roadway from ditch-to-ditch or berm-to-berm.

BIOTIC COMMUNITIES

This section describes the biotic environment in the vicinity of Boxcar Wash and adjacent to the Northshore Road corridor. The discussions include vegetation and the wildlife subsections of birds, mammals, reptiles, and amphibians. Threatened and endangered species and species of concern are addressed in the following section of this report.

Vegetation

Boxcar Wash

Boxcar Wash is a desert wash of moderate to large size for Lake Mead NRA (figure 2). It has a fine sediment and gravel bottom and drains hills and ridges covered by desert soils hardened by gravel-sized desert pavement. Boxcar Wash vegetation is sparse, less than 5% aerial cover, and consists of cheesebush (*Hymenoclea salsola*), rush bebbia (*Bebbia juncea*), catclaw acacia (*Acacia greggii*), honey mesquite (*Prosopis glandulosa*), Nevada ephedra (*Ephedra nevadensis*), four-wing saltbush (*Atriplex canescens*), Parry sandpaper plant (*Petalonyx parryi*), and brittlebush (*Encelia farinosa*) in the shrub layer. Forb and grass species observed in this desert wash included big galleta grass (*Pleuraphis rigida*), plantain (*Plantago* sp.), spurge (*Chamaesyce* sp.), desert trumpet (*Eriogonum inflatum*), Russian-thistle, and an annual grass species. Russian-thistle was also abundant on the silt deposit adjacent to Northshore Road and the Northshore Road fill slopes at Boxcar Wash.

Northshore Road

The Northshore Road corridor was constructed through sparse desert shrub and small, narrow desert wash plant communities of the Mojave Desert section of the American Semi-desert and Desert Province (NatureServe 2002). Generally, the erosion fans and small hills associated with the project corridor support the creosotebush (*Larrea tridentata*) – white bursage (*Ambrosia dumosa*) plant association (NatureServe 2002), occupying a desert pavement of gravel-sized stones. Vegetative cover values for this type are relatively sparse, rarely exceeding 5% to 10%. Shrubs common to the corridor include creosotebush, white bursage, indigobush (*Psorothamnus fremontii*), Pima rhatany (*Krameria erecta*), beavertail cactus (*Opuntia basilaris*), buckhorn cholla (*Opuntia acanthicarpa*), and brittlebush. In the vicinity of the curves identified for potential realignment, the pygmy barrel cactus (*Sclerocactus johnsonii*) was also present within the type. Herbaceous species present within this association included desert trumpet and other buckwheat species, mallow (*Sphaeralcea* sp.), fluffgrass (*Erioneuron pulchellum*), and an annual grass species among others.

Small drainages cross and occur along the Northshore Road project corridor and contain a species composition similar to the larger washes. However, these drainages, only a few meters wide, have sparse vegetative cover values ranging from 5% to 10%, containing the dominants big galleta grass, threeawn (*Aristida* sp.), white bursage, range rhatany, and Nevada ephedra.

A small slope covered by basalt rocks, from gravel- to boulder-sized, is present adjacent to Northshore Road. This habitat contains a desert holly (*Atriplex hymenelytra*) sparse shrub association. The cover value of this type is less than 5%. Species associated with desert holly include the sunray (*Enceliopsis argophylla*), desert trumpet and other species of annual buckwheat, prickly poppy (*Argemone* sp.), and moss species.

The Redstone site represented a unique habitat for many plant species and supported the highest cover value for plant associations of the area at 10% to15% for some shrub stands. Sandstone rock

surfaces have some patches of mosses and lichens, particularly on north-facing exposures. The creosotebush – white bursage sparse shrub association surrounds the exposed bedrock formations, growing up to the base of these exposures. However, where sand has accumulated in small dunes, additional species are present and include snakeweed (*Gutierrezia sarothrae*), shrubby buckwheat (*Eriogonum* sp), and goldenbush (*Machaeranthera* sp). Drainages through this sandy area supported big galleta grass, cheesebush, rush bebbia, catclaw acacia, brittlebush, and Nevada ephedra.

Gypsiferous soils of the area are very fine-grained and are exposed on hills, ridges, and wash edges along the proposed rehabilitation segment of Northshore Road. The gypsum ranges in color from pinkish-white to greenish and is highly erosive. Gypsiferous soils adjacent to the corridor support a few Las Vegas bearpoppy, a species of concern described in the next section, but most sites are occupied by the sunray, a rare plant that is relatively uncommon in Lake Mead NRA, milkvetch (possibly *Astragalus preussii*), and by species of annual buckwheat (*Eriogonum inflatum, E. trichopes, or E. insigne*). Ringstem (*Anulocaulis leiosolenus*) is also an uncommon plant at Lake Mead NRA that is found on gypsiferous soils. Vegetative cover values for the gypsiferous soils are very sparse, typically less than 1% to 2%. The shrub spiny menodora (*Menodora spinescens*) was observed on one gypsiferous site, and the borage (*Tiquilia latior*) is present on another exposure. On the finer exposures of gypsiferous soils, cryptobiotic crust formations are evident.

Plant species of disturbed roadsides included mallow, purple threeawn (*Aristida purpurea*), snakeweed, and the exotics red brome (*Bromus madritensis*), a few sunray, and filaree (*Erodium cicutarium*) and Mediterranean grass (*Schismus barbatus* and *S. arabicus*).

Wildlife

Mammals

Lake Mead NRA (2002) lists 74 species of mammals as occurring within available habitats. Of this total, bats comprised 26% of the mammal species present, while 37% of listed mammals are considered to be adapted to lower-elevation desert habitats (Schwartz et al. 1978). Habitat for bat species could occur at the Redstone turnout area due to the many holes, small caves, and rock crevices that may be used for roosting.

Common mammals that would be expected along the Northshore Road corridor include the desert cottontail (*Sylvilagus audubonii*); black-tailed jackrabbit (*Lepus californicus*); Merriam's, Ord's, and desert kangaroo rats (*Dipodomys merriami, D. ordii,* and *D. deserti*); least chipmunk (*Eutamias minimus*); deer, cactus, and desert pocket mice (*Peromyscus maniculatus, P. eremicus,* and *Chaetodipus penicillatus*); badger (*Taxidea taxus*), and coyote (*Canis latrans*). The desert bighorn sheep (*Ovis canadensis*) is relatively common within the Northshore Road corridor, using the variety of habitats present.

Reptiles and Amphibians

Of the 43 species of reptiles listed for Lake Mead NRA (LAME 2002, Schwartz et al. 1978), species of lizards were the most commonly observed during a November walking survey of the Northshore Road corridor. Surveys for the rare desert tortoise were conducted and are reported in the following section, "Threatened and Endangered Species and Species of Concern." The lizard species most likely to occur in habitats along this corridor include the western banded gecko (*Coleonyx variegata*), desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), collared lizard (*Crotaphytus collaris*), leopard lizard (*Crotophytus wislizenii*), side-blotched lizard (*Uta stansburiana*), desert horned lizard (*Phrynosoma platyrhinos*), and western whiptail (*Cnemidophorus tigris*). A variety of snakes may also be expected to occur here, including the speckled rattlesnake (*Crotalus mitchelli*), coachwhip (*Masticophis flagellum*), and gopher snake (*Pituophis melanoleucus*) (LAME 2002; Schwartz et al. 1978).

Eleven species of amphibians are known for Lake Mead NRA (LAME 2002, Schwartz et al. 1978). Amphibians that may be expected within the desert habitats surrounding the project corridor include species of toads, including the red-spotted (*Bufo punctatus*), Woodhouse's (*B. woodhouseii*), and southwestern (*B. microscaphus*).

Birds

Due to the creation of Lakes Mead and Mohave and the associated aquatic, wetland, and riparian habitats, over 350 species of birds have been listed for Lake Mead NRA (LAME 2002). Within the Northshore Road corridor, bird species commonly expected to occur include the golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), common raven (*Corvus corax*), mourning dove (*Zenaida macroura*), loggerhead shrike (*Lanius ludovicianus*), and white-crowned sparrow (*Zonotrichia leucophrys*), among other species. The common raven is of interest because they forage on a variety of foods, including the eggs and young of reptiles such as those of the federally threatened desert tortoise.

THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

Under the Endangered Species Act of 1973, as amended, an endangered species is defined as any species in danger of extinction throughout all or a significant portion of its range. There are no federally endangered species known for the Northshore Road corridor. A threatened species is defined as any species likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range. The desert tortoise is a federally threatened species that occupies habitat throughout the project region, and is listed as a critically endangered species by the state of Nevada.

The USFWS is responsible for providing other federal agencies with a list of endangered or threatened species, or species of concern, that may be affected by a proposed federal action (USDI-

FWS 2001). The species list for the proposed project includes the desert tortoise, listed as threatened, and the following species of concern: chuckwalla (*Sauromalus obesus*), banded Gila monster (*Heloderma suspectum cinctum*), Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat. The Nevada Natural Heritage Program (NNHP) identified three moss species as state species of concern. These are Gold Butte moss, seriate crossidium, and Sweet trichostomum (NNHP 2002).

As described in the biological assessment for Northshore Road, MP 20.8 – 30.3 (Appendix C: Biological Assessment Executive Summary), the Northshore Road corridor provides potential habitat for all of the above-listed species of concern. One species of concern documented as existing near Northshore Road, and within the project area, is the Las Vegas bearpoppy. There is no designated critical habitat in the vicinity of the Northshore Road corridor.

Reptiles

The threatened desert tortoise and all species of concern have been addressed fully in the appended biological assessment, prepared by Lake Mead NRA for the USFWS in January 2003. A summary of the biological assessment is included in appendix C. Brief descriptions of threatened species and species of concern are presented below.

Desert tortoises are distributed from southeastern California, southern Nevada, and extreme southwestern Utah, through western and southern Arizona and northern Mexico (NatureServe 2002c, Boyles 1998). They are predominantly herbivorous and semifossorial (burrowing) inhabitants of warm upland plateaus and mountain slopes in the Mojave Desert. Desert tortoises occupy creosotebush scrub and the creosotebush–white burrobush community. The native grass, big galleta, is often present where the desert tortoise is most abundant. In general, desert tortoises forage primarily on native winter and summer annual plants (dicots and grasses), perennial grasses, cacti, and perennial shrubs in descending order of preference. Insects, caterpillars, and other insect larvae may also be eaten, and desert tortoises have been observed biting road-killed anurans and lizards (Grant 1936, Brown 1968, Okamoto 1995 in NatureServe 2002c). It has been suggested that an active adult desert tortoise requires about 45 pounds (21 kilograms) of herbaceous forage per month (NatureServe 2002c).

During the 1970s, it became apparent that desert tortoise populations were declining throughout a significant portion of their range. Many factors have been implicated, including:

- land development,
- off-road vehicle travel,
- poaching and vandalism (including shooting),
- disease (especially upper respiratory tract disease caused by a mycoplasma),
- overgrazing by livestock, burro, and horse,
- habitat degradation due to exotic plant invasion,
- range fires fueled by exotic annual grasses and forbs,

- energy and mineral development,
- road and highway traffic/collisions,
- trail construction,
- collecting,
- predation by the common raven, coyote, feral dogs and cats (associated with human garbage dumps and backyard feedings),
- release of non-native desert tortoises into areas occupied by native populations, and
- natural droughts (resulting in poor nutrition and immunocompromise).

(Oldemyer 1994, USFWS 1990, Jacobson et al. 1995, CDF&G 1990, Berry 1992 in NatureServe 2002c and Boyles 1998.) The desert tortoise was listed as threatened under USFWS listing procedures in 1990 (USFWS 1990).

Desert tortoises have been observed historically in the area of Northshore Road during inventory and research efforts (Boyles 1998). They were considered widespread, but existing in small numbers throughout Lake Mead NRA below approximately 4,000-feet in elevation (Schwartz et al. 1978). The Northshore Road portion of Lake Mead NRA was surveyed between 1995 and 1997, and was determined to have higher densities of desert tortoise than most other areas of Lake Mead NRA (Boyles 1998, Boyles 2002). Observations made from this survey were: (1) the project corridor is located within occupied desert tortoise habitat, (2) habitat quality along the road is marginal, (3) habitat quality improves with increasing distance from the roadway, and (4) to prevent desert tortoise mortalities, the project corridor should be temporarily fenced and ground-surveyed for the presence of desert tortoise immediately prior to construction activity. During 2002, Boyles (Lake Mead NRA wildlife biologist) surveyed the area in and around Boxcar Wash and found no desert tortoise habitat or desert tortoise sign. Southern Nevada Environmental, Inc. conducted a desert tortoise survey along the remainder of the corridor and found a carcass at about MP 28, in addition to desert tortoise scat and burrows. These results are consistent with those of LeNoue and VanInwagen (1993), which determined several burrows, dens, and individual desert tortoise in the vicinity of this segment of Northshore Road. It can be assumed that desert tortoise individuals cross Northshore Road as part of their normal activity.

Chuckwallas are present in southern Nevada, southern Utah, southeastern California, western Arizona, southern Baja California, and west-central Sonora. The species is considered widespread and common in California and much of Arizona; however, Nevada ranked chuckwalla status as "undetermined" due to a lack of information, or substantially conflicting information about chuckwalla status or trends (NatureServe 2002d). The greatest threats to the chuckwalla are excessive collecting and habitat destruction (including habitat damage from collecting, where rocks are overturned and fissures and exfoliations are broken open).

Chuckwallas prefer rocky desert, lava flows, hillsides, and rock outcrops, where they can bask on rocks and take shelter in rock crevices. Chuckwalla range is characterized by creosotebush. The chuckwalla is generally a herbivore, browsing on a wide variety of leaves, buds, flowers, and fruits (of various plant species). It will occasionally eat insects (NatureServe 2002d).

Banded Gila monsters are present in the Mojave Desert of Nevada, Arizona, and California. Little is known about the subspecies; however, it occupies Mojave desert scrub and desert grassland, typically in rocky areas (NatureServe 2002e). This large lizard may spend over 95% of its life underground or under cover of some type. The diet of banded Gila monsters consists of small mammals, eggs of ground-nesting birds and other reptiles, lizards, insects, and carrion. The subspecies can transmit a venom almost as toxic as that of the western diamondback rattlesnake (*Crotalus atrox*), but unlike the rattlesnake, the Gila Monster secretes venom by biting and chewing.

Plants

The Las Vegas bearpoppy is typically found on gypsiferous soils in desert shrub communities. The habitat consists of open, dry, spongy or powdery, often dissected badlands; hummocked soils with high gypsum content, often with a well-developed soil crust; in areas of generally low relief on all aspects and slopes; and in association with a sparse cover of creosotebush, saltbush, and blackbrush (*Coleogyne ramosissima*) (NNHP 2001). The bearpoppy is a perennial forb that forms rounded clumps and produces a yellow flower (NNHP 2001, Welsh et al. 1993).

Threecorner milkvetch occupy sandy to fine-textured soil in mixed desert shrub communities. Specifically, the habitat is described as open, deep, sandy soil or dunes, generally stabilized by vegetation and/or a gravel veneer (NNHP 2001). It is an annual forb with white flowers that bloom in the spring.

Sticky buckwheat occupies desert wash, sand flats, roadsides, and deep sands with mesquite, creosotebush, white bursage, and indigobush, among several other shrub species (NatureServe 2002f, NNHP 2001). Sticky buckwheat has been reported as growing with saltcedar (*Tamarix ramosissima*) and arrowweed (*Pluchea sericea*) in some sandy desert washes. It is an annual forb with small yellow flowers that bloom in April and May. The stems and branches are slightly sticky and often covered with adhering sand particles. This species has not been relocated in the area and may not actually occur.

Portions of the corridor may provide habitat for three species of moss listed by the state of Nevada (NNHP 2002). Sweet trichostomum, seriate crossidium, and Gold Butte moss are sensitive mosses that may occur in habitats along Northshore Road. Sweet trichostomum occupies sandstone bluffs and sandstone-derived soils, often shaded by rocks, in the creosotebush-white bursage plant association. This species is only known from the Redstone parking area, but may not be present in the construction area. Care will be taken to disturb only what is absolutely necessary for construction in the Redstone picnic area. Seriate crossidium are also present in the creosotebush-white bursage plant association, occupying sandstone and gypsiferous bluffs, outcrops, rock piles, and soils. The habitat is often protected on the north or east sides of rocks or shrubs, or at the bases of bluffs (NNHP 2001). Gold Butte moss is present on or near gypsiferous deposits and outcrops or on limestone boulders, especially on east- to north-facing slopes of loose, uncompacted soil. It is often associated with other mosses and lichens, forms a dense turf, and is blackish-green above and

reddish-brown below (NNHP 2001). No records of seriate crossidium or Gold Butte moss are known to exist.

FLOODPLAINS AND WATER QUALITY

This segment of Northshore Road crosses 18 small desert washes. Washes eventually drain into Lake Mead at Boulder and Virgin basins. Boxcar Wash is a moderate to large desert wash draining into Boulder basin. Washes are typically dry, but they occasionally experience flash flooding during thunderstorms in July, August, and early September. Where Northshore Road crosses a wash, medium-to-large diameter culverts are installed beneath the road surface to allow for continuous flow of water.

Lake Mead is the source of drinking water for millions of people living in Arizona, Nevada, and California. The lake also provides an environment for aquatic life, and for human recreation uses such as swimming, water skiing, windsurfing, fishing, and boating. The water of Lake Mead typically meets state drinking quality standards, although there is occasional degradation near harbors, high-use coves, and where perennial streams enter the lake.

The *Lake Mead National Recreation Area Resource Management Plan* (1999) identifies a number of internal threats to water quality at the lake(s), including heavy recreation use in coves (producing pollution from human waste and litter); and boat use in harbors (producing pollution from illegal sewage discharge and petrochemical spills). External threats to water quality in the lake(s) include: an assortment of substances transported to the lake by tributaries such as Las Vegas Wash and the Colorado River, deposition of air pollutants into lake water, and impacts from adjacent land uses and from increasing development.

The primary water concern for Lake Mead NRA is reduction of the quality due to chemical and biological pollutants in lake water, including petrochemicals and bacteria associated with human waste. Turbidity (water cloudiness) and sedimentation have not been major concerns thus far. Washes in the project area are ephemeral, and water quality data are not yet available.

AIR QUALITY

Lake Mead NRA is designated a Class II air quality area under the Clean Air Act. Air quality within the region is generally good, but some degradation of air quality occurs in lower elevations of the recreation area. Air pollutants primarily originate from outside Lake Mead NRA and tend to concentrate during periods of atmospheric inversion. Major sources of air pollutants within or adjacent to the recreation area include: the Mohave power generating plant near Laughlin, Nevada, as well as other power generating plants in the region; emissions from motor vehicles from the Las Vegas valley and other urban areas; particulates from gravel and gypsum quarries; and fugitive dust from disturbed lands and construction activities. Air quality regulations within the project area,

including Clean Air Act regulations, are administered by the Clark County (Nevada) Air Pollution Control Division (NPS 2001c).

Lake Mead NRA offers spectacular vistas and scenic views in the vicinity of Lakes Mead and Mohave. However, degraded air quality sometimes causes visible smog, which tends to reduce the scenic value of the area. Preserving air quality is integral to providing a high quality visitor experience.

SOILS AND GEOLOGY

Geologic formations exposed along the segment of Northshore Road proposed for rehabilitation are principally the Permian-age Esplanade, Coconino, Toroweap, and Kaibab (USGS 2002). These formations were deposited/formed by rivers, dunes, and carbonate coastal plains of shallow seas, approximately 280 to 260 million years ago. The Esplanade and Coconino Formations are part of the red bed geologic sequence, which was initially deposited as river sediments and then was redistributed by wind into large dunes.

The Toroweap and Kaibab formations resulted from two major episodes of filling and drying of shallow seas across this region. The alternate wetting and drying of Lake Mead NRA resulted in the deposition of a distinctive sequence of rocks over two separate periods of marine inundation. These were both thick, cherty, limestone sequences of deposition that resulted in erosion-resistant, cliff-forming materials. During the periods just prior to and following the marine invasions that deposited the Toroweap and Kaibab formations, the region was a saline coastal plain known as a sabkah. The periods when coastal plains were present resulted in the deposition of gypsum-rich silts, which form the light-colored and recessed weathering slopes above and below the Toroweap and Kaibab formation cliffs.

Bright red, Jurassic-age Aztec sandstone has become exposed at the Redstone parking area off Northshore Road (USGS 2002) (figure 6). This striking formation is honey-combed with holes, caves, crevices, and other erosional features that make it aesthetically interesting and provide habitat for wildlife species. These red rocks represent ancient desert sands that blew into dunes and still show the large, sweeping, arc-shaped sand layers (cross-stratification) that formed over 185 million years ago. The Aztec sandstone is actually made up of very pale grains of quartz sand; however, the intense red color is imparted by small amounts of red or yellow, iron-rich (rust) cement that bonds individual grains together.

Soils derived from Aztec sandstone are predominantly fine sands, tan in color, that have been formed into small dunes (eolian deposits) at the base of the rocks by wind action. These dunes are a few centimeters to more than a meter deep and support a distinctive flora. Gypsum soils are very fine-grained clay, sometimes topped by cryptogrammic crusts, are present at several locations in the corridor, and have the potential to support endemic plant species. However, the majority of the corridor consists of hills and ridges covered by varnished desert gravel and rocks, which serve to pave the ground surface.

Lithosols are the primary desert soils of the project area. These soils are typically shallow, gray in color, high in salt content, and underlain by caliche hardpans (NPS 1986). In portions of the project area, the soil surface consists of desert pavement. Desert pavement is produced by the removal of surface fines (loose fine sand particles) by the action of wind and water. Rocks in desert soil often serve as surface "armor," limiting erosion.

FIGURE 6. AZTEC SANDSTONE FORMATION

In areas previously disturbed by construction and grading, soil fines deposited on the surface during construction are subject to erosion and colonization by various weed species, like Russian thistle. Loss of topsoil and fines occurs until wind and water erode the fines from the surface and the site is "re-armored." This process may take years, although periodic storms may remove significant amounts of soil in a short period of time.

VISITOR USE AND EXPERIENCE

Visitor use on this road segment is primarily an access corridor for people going to Callville Bay, Echo Bay, Overton Beach, or other areas of the lake. Traffic volume data from NPS Count Station 1911 on Northshore Road show that AADT on the route was approximately 350 vehicles per day in 1993 (Robert Peccia and Associates, Inc. 1995). Turnouts provide opportunities to view geological formations and the Redstone parking lot provides a short hiking trail, picnic area, and restroom facilities.

Impacts on visitor experience monitored by the National Park Service throughout Lake Mead NRA include visitor satisfaction, boating accidents, traffic circulation, waiting time to launch, launch ramp parking lot capacity, empty slips in the marinas, boat distribution, quality of recreational facilities, and visitor exposure to flood hazards.

HEALTH AND SAFETY

In 1995, the National Park Service conducted a Traffic Safety Program Review for roads within Lake Mead NRA (Robert Peccia and Associates, Inc. 1995). As the primary means of analyzing accident data, overall accident rates for major road segments were developed. Accident rates were expressed as the number of accidents per million vehicle-miles traveled (MVMT). For Northshore Road, between Callville Bay Road and Echo Bay Road, the number of accidents between 01 January 1990 through 31 December 1993, was 54 and the MVMT was 11.9, resulting in an accident rating of 4.53. This rating was the fifth highest of the 15 Lake Mead NRA road segments that were rated.

The most apparent problem on Northshore Road is the number of motorists traveling at excessive speeds. Excessive speed presents a unique problem for motorists driving vehicles with trailers, as the trailers tend to slide off the side of the road. In some areas, short sight distances add to problems when combined with excessive speeds. Recommendations in the traffic safety report for Northshore Road include reconstruction to a 32-foot-wide roadway with travel lanes and paved shoulders (Robert Peccia and Associates, Inc. 1995).

Another aspect of safety in the project area is flash flooding in desert washes. Most annual precipitation falls during intense thunderstorms from July through early September. A hydrological study conducted by PS&J (2003) concluded that all but three of the culverts are under-designed for a 50-year storm event. Boxcar Wash CBC is designed for a 10-year storm event, which proved inadequate during a 2002 storm event. Under-designed culverts could lead to road failure due to embankment erosion and floodwaters overtopping roadways.

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section presents the likely beneficial and adverse effects to the natural and human environment that would result from implementing the alternatives under consideration. This section describes short-term and long-term effects, direct and indirect effects, cumulative effects, and the potential for each alternative to impair park resources. Interpretation of impacts in terms of their duration, intensity (or magnitude), and context (local, regional, or national effects) are provided where possible.

METHODOLOGY

This section contains the environmental impacts, including direct and indirect effects, and their significance to the alternatives. It also assumes that the mitigation and monitoring measures section of this EA would be implemented under any of the applicable alternatives, as identified in each mitigation criteria.

Impact analyses and conclusions are based on NPS staff knowledge of resources and the project area, review of existing literature, and information provided by experts in the National Park Service or other agencies. Any impacts described in this section are based on preliminary design of the alternatives under consideration. Effects are quantified where possible; in the absence of quantitative data, best professional judgment prevailed.

CRITERIA AND THRESHOLDS FOR IMPACT ANALYSIS

The following are laws, regulations, and/or guidance that relates to the evaluation of each impact topic.

Soils and Vegetation

Laws, Regulations, and Policies. *NPS Management Policies* (4.8) stipulates that the National Park Service will preserve and protect geologic resources as integral components of park natural systems. Geologic resources includes geologic features and geologic processes. The fundamental policy, as stated in the NPS *Natural Resources Management Guideline* (NPS-77) is the preservation of the geologic resources of parks in their natural condition whenever possible.

Soil resources would be protected by preventing or minimizing adverse potentially irreversible impacts on soils, in accordance with *NPS Management Policies*. NPS-77 specified objectives for each

management zone for soil resources management. These management objectives are defined as: (1) natural zone—preserve natural soils and the processes of soil genesis in a condition undisturbed by humans; (2) cultural zone—conserve soil resources to the extent possible consistent with maintenance of the historic and cultural scene and prevent soil erosion wherever possible; (3) park development zone—ensure that developments and their management are consistent with soil limitations and soil conservation practices; and, (4) special use zone—minimize soil loss and disturbance caused by special use activities, and ensure that soils retain their productivity and potential for reclamation.

Zones within the recreation area have been designated in the Lake Mead NRA *General Management Plan*, which provides the overall guidance and management direction for Lake Mead NRA.

The NPS Organic Act directs Lake Mead NRA to conserve the scenery and the natural objects unimpaired for future generations. *NPS Management Policies* defines the general principles for managing biological resources as maintaining all native plants and animals as part of the natural ecosystem. When NPS management actions cause native vegetation to be removed, then the National Park Service will seek to ensure that such removals will not cause unacceptable impacts to native resources, natural processes, or other Lake Mead NRA resources.

Exotic species, also referred to as non-native or alien, are not a natural component of the ecosystem. They are managed, up to and including eradication, under the criteria specified in *NPS Management Policies* and *NPS-77*.

Impact Indicators, Criteria, and Methodology. The following impact thresholds were established for the project area:

- *Negligible impacts*: Impacts have no measurable or perceptible changes in soil structure and occur in a relatively small area. Impacts have no measurable or perceptible changes in plant community size, integrity, or continuity.

- *Minor impacts*: Impacts are measurable or perceptible, but localized in a relatively small area. The overall soil structure would not be affected. Impacts are measurable or perceptible and localized within a relatively small area. The overall viability of the plant community would not be affected and, if left alone, would recover.

- *Moderate impacts*: Impacts would be localized and small in size, but would cause a permanent change in the soil structure in that particular area. Impacts would cause a change in the plant community (e.g., abundance, distribution, quantity, or quality); however, the impact would remain localized.

- *Major impacts*: Impact to the soil structure would be substantial, highly noticeable, and permanent. Impacts to the plant community would be substantial, highly noticeable, and permanent.

- *Impairment*: For this analysis, impairment is considered a permanent change in a large portion of the overall acreage of Lake Mead NRA. The impact would contribute substantially to the deterioration of native vegetation. These resources would be affected over the long-term to the point that Lake Mead NRA's purpose (Enabling Legislation, *General Management Plan*, *Strategic Plan*) could not be fulfilled and resources could not be experienced and enjoyed by future generations.

Wildlife and Wildlife Habitat

Laws, Regulations, and Policies. The NPS Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the National Park Service to mean native animal life should be protected and perpetuated as part of the recreation area's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible. The restoration of native species is a high priority. Management goals for wildlife include maintaining components and processes of naturally evolving recreation area ecosystems, including natural abundance, diversity, and ecological integrity of plants and animals.

Lake Mead NRA also manages and monitors wildlife cooperatively with the Arizona Game and Fish Department and the Nevada Division of Wildlife.

Impact Indicators, Criteria, and Methodology. The impacts of wildlife were evaluated in terms of impacts to individual animals and wildlife habitat. Specific localized impacts were estimated based on knowledge garnered from similar past activities.

The following are standards used by the National Park Service in interpreting the level of impact to wildlife:

- *Negligible impacts*: No species of concern is present; no impacts or impacts with only temporary effects are expected.

- *Minor impacts*: Nonbreeding animals of concern are present, but only in low numbers. Habitat is not critical for survival; other habitat is available nearby. Occasional flight responses by wildlife are expected, but without interference with feeding, reproduction, or other activities necessary for survival.

- *Moderate impacts*: Breeding animals of concern are present; animals are present during particularly vulnerable life stages, such as migration or winter; mortality or interference with activities necessary for survival expected on an occasional basis, but not expected to threaten the continued existence of the species in the recreation area.

- *Major impacts*: Breeding animals are present in relatively high numbers, and/or wildlife is present during particularly vulnerable life stages. Habitat targeted by action alternatives has a history of use by wildlife during critical periods, but there is suitable habitat for use nearby.

Few incidents of mortality could occur, and the continued survival of the species is not at risk.

- *Impairment*: The impact would contribute substantially to the deterioration of natural resources to the extent that recreation area wildlife and habitat would no longer function as a natural system. Wildlife and its habitat would be affected over the long-term to the point that the recreation area's purpose (Enabling Legislation, *General Management Plan*, *Strategic Plan*) could not be fulfilled and resource could not be experienced and enjoyed by future generations.

Air Quality

Laws, Regulations, and Policies. Air pollution sources within recreation area's must comply with all federal, state, and local regulations. The regulations and policies that govern pollutants of concern are discussed briefly below.

Lake Mead NRA is designated as a Class II Air Quality area under the Clean Air Act. The main purpose of this act is to protect and enhance the nation's air quality to promote the public health and welfare. The act establishes specific programs to provide protection for air resources and values, including the program to prevent significant deterioration of air quality in clean air regions of the country. Although Lake Mead NRA is designated as a Class II Air Quality area, the NRA strives to maintain the highest air quality standards, and project work within the boundaries is completed in accordance with regional standards. However, Lake Mead NRA does not possess sufficient autonomous authority to address issues of air quality improvements when air pollution originates outside the boundaries.

NPS Management Policies direct recreation areas to seek to perpetuate the best possible air quality to preserve natural and cultural resources, sustain visitor enjoyment, human health, and preserve scenic vistas (4.7). Recreation areas are directed to comply with all federal, state, and local air quality regulations and permitting requirements. In cases of doubt as to the impacts of existing or potential air pollution on recreation area resources, the National Park Service "will err on the side of protecting air quality and related values for future generations."

Impact Indicators, Criteria, and Methodology. Information from the literature was used to assess probable impacts to air quality. There are four impact categories relevant to air quality issues: negligible, minor, moderate and major. Each category is discussed below relative to potential airborne pollution impacts from the alternatives on recreation area resources and human health.

- *Negligible impacts*: There is no smell of exhaust and no visible smoke. Dust from construction activities can be controlled by mitigation.

- *Minor impacts*: There is a slight smell of exhaust and smoke is visible during brief periods of time. Dust from use of the dirt roads is visible during brief periods. Dust from construction activities is visible only during the work period, but most can be controlled by mitigation.

- *Moderate impacts*: There is a smell of gasoline fumes and exhaust in high-use areas. Smoke is visible during periods of high use. Dust from the use of dirt roads is visible for an extended area. Dust from construction activities is visible for an extended area for an extended period, but is reduced by mitigation.

- *Major impacts*: Smoke and gasoline fumes are easily detectable for extended periods of time in a large area. Dust from the use of dirt roads and construction activities is visible for an extended period for an extended amount of time, and mitigation is unable to alleviate the conditions.

Cultural Resources

Laws, Regulations, and Policies. Numerous legislative acts, regulations, and NPS policies provide direction for the protection, preservation, and management of cultural resources on public lands. Further, these laws and policies establish what must be considered in general management planning and how cultural resources must be managed in future undertakings resulting from the approved plan, regardless of the final alternative chosen. Applicable laws and regulations include the NPS Organic Act (1916), the Antiquities Act of 1906, the National Historic Preservation Act of 1966 (1992, as amended), the National Environmental Policy Act of 1969, the National Parks and Recreation Act of 1978, the Archeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, Executive Order 13007 *Indian Sacred Sites* (1996), and the Curation of Federally Owned and Administered Archeological Collections (1991).

Applicable agency policies relevant to cultural resources include Chapter 5 of *NPS Management Policies*, and the *Cultural Resource Management Guideline (Director's Order-28)*, as well as other related policy directives such as the NPS *Museum Handbook*, the NPS *Manual for Museums*, and *Interpretation and Visitor Services Guidelines (NPS-26)*.

The Antiquities Act of 1906 (PL 209) authorized the president to establish historic landmarks and structures as monuments owned or controlled by the U.S. government and instituted a fine for unauthorized collection of their artifacts.

The NPS Organic Act (16 USC 1-4) established the agency to manage the parks and monuments with the purpose of conserving historic objects within them and providing for their enjoyment.

The National Historic Preservation Act of 1966 (16 USC 470, *et seq*.) requires in section 106 that federal agencies with direct or indirect jurisdiction over undertakings take into account the effect of those undertakings on properties that are listed on, or eligible for listing on, the National Register of Historic Places. Section 110 of the act further requires federal land managers to establish programs

in consultation with the SHPO to identify, evaluate, and nominate properties to the national register. This act applies to all federal undertakings or projects requiring federal funds or permits.

The National Environmental Policy Act of 1969 (NEPA; PL 91-190) sets forth federal policy to preserve important historic, cultural, and natural aspects of our national heritage and accomplishes this by assisting federal managers in making sound decisions based on an objective understanding of the potential environmental consequences of proposed management alternatives. This act applies to any federal project or other project requiring federal funding or licensing. This act requires federal agencies to use a systematic, interdisciplinary approach integrating natural and social sciences to identify and objectively evaluate all reasonable alternatives to a proposed action.

The National Parks and Recreation Act of 1978 (PL 95-625) requires that general management plans be developed for each unit in the national park system and that they include, among other things, measures for the preservation for the area's resources and an indication of the types and intensities of development associated with public use of a given unit.

The Archeological Resources Protection Act of 1979 (16 USC 470aa-mm) further codifies the federal government's efforts to protect and preserve archeological resources on public lands by stiffening criminal penalties, as well as instituting civil penalties, for the unauthorized collection of artifacts. Additionally, it establishes a permit system for the excavation and removal of artifacts from public lands, including their final disposition, as well as confidentiality provisions for sensitive site location information where the release of such information may endanger the resource.

The Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001) sets forth procedures for determining the final disposition of any human remains, funerary objects, or objects of cultural patrimony that are discovered on public lands or during the course of a federal undertaking.

Executive Order 13007, *Indian Sacred Sites*, 1996 (61 FR 26771) instructs all federal land management agencies, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites.

"The Curation of Federally Owned and Administered Archeological Collections" (36 CFR 79) establishes guidelines and procedures for the proper curation and management of archeological collections owned or administered by federal agencies.

Impact Indicators, Criteria, and Methodology. Impacts on cultural resources were developed based on existing conditions, current regulations, and likely development trends. The inventory of archeological resources in the recreation area is largely incomplete. For purposes of assessing impacts, all unrecorded resources are considered potentially eligible for listing on the National Register of Historic Places.

Lake Mead NRA's inventory of standing structures and cultural landscapes is relatively complete; however, many structures and landscapes still require evaluation to determine their eligibility for listing on the National Register of Historic Places. For purposes of assessing potential impacts to these properties, unevaluated structures and landscapes are assumed to be potentially eligible.

Under section 106, only historic resources that are eligible or are listed on the National Register of Historic Places are considered for impacts. An impact, or effect, to a property occurs if a proposed action would alter, in any way, the characteristics that qualify it for inclusion on the national register. If the proposed action would diminish the integrity of any of these characteristics, it is considered to be an adverse effect.

For the purposes of this document, the level of impacts to cultural resources was accomplished using the following criteria:

- *Negligible impacts*: No potentially eligible or listed properties are present; no direct or indirect impacts.

- *Minor impacts*: Potentially eligible or listed properties are present; no direct impacts or impacts with only temporary effects are expected.

- *Moderate impacts*: Potentially eligible or listed properties are present; indirect impacts or, in the case of structures where activity is limited to rehabilitation, conducted in a manner that preserves the historical and architectural value of the property.

- *Major impacts*: Potentially eligible or listed properties present; direct impacts including physical destruction, damage, or alternation of all or part of a property. Isolation of a property from or alteration of the character of a property's setting when that character contributes to its eligibility, including removal from its historic location. Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting. Neglect of a property resulting in its deterioration or destruction (36 CFR 800.5).

- *Impairment*: Loss, destruction, or degradation of a cultural property, resource, or value to the point that it negatively affects the recreation area's purpose and visitor experience.

In the absence of quantitative data concerning the full extent of actions under a proposed alternative, best professional judgment prevailed.

CRITERIA AND THRESHOLDS FOR IMPACT ANALYSES OF ALL OTHER ISSUES

Impacts to water resources, soundscapes, visual resources, public safety, visitor use and experience, and park operations were analyzed using the best available information and best professional judgment of Lake Mead NRA staff.

Terms referring to impact intensity, context, and duration are used in the effects analysis. Unless otherwise stated, the standard definitions for these terms are as follows:

- *Negligible impacts*: The impact is at the lower level of detection; there would be no measurable change.
- *Minor impacts*: The impact is slight but detectable; there would be a small change.
- *Moderate impacts*: The impact is readily apparent; there would be a measurable change that could result in a small but permanent change.
- *Major impacts*: The impact is severe; there would be a highly noticeable, permanent, measurable change.
- *Localized impact*: The impact occurs in a specific site or area. When comparing changes to existing conditions, the impacts are detectable only in the localized area.
- *Short-term effect*: The effect occurs only during or immediately after implementation of the alternative.
- *Long-term effect*: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

IMPAIRMENT ANALYSIS

Impairment to Lake Mead NRA resources and values are analyzed in this section. Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of recreation area resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is key to the cultural or natural integrity of Lake Mead NRA or that is a resource or value needed to fulfill a specific purpose identified in the enabling legislation. An impact would be less likely to constitute impairment if it is an unavoidable result that cannot be reasonably mitigated or an action necessary to preserve or restore the integrity of Lake Mead NRA resources or values.

A determination of impairment is made in the "Conclusion" section of all natural and cultural resource impact topics of this document. Impairment statements are not required for recreational values / visitor experience or safety-related topics.

CUMULATIVE EFFECTS

Cumulative effects are the direct and indirect effects of a proposed project alternative's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR Part 1508.7). Guidance for implementing NEPA (PL 91-190, 1970) requires that federal agencies identify the temporal and geographic boundaries within which they will evaluate potential cumulative effects of an action and the specific past, present, and reasonably foreseeable projects that will be analyzed. This includes potential actions within and outside the recreation area boundary. The geographical boundaries of analysis vary depending on the impact topic and potential effects. While this information may be inexact at this time, major sources of impacts have been assessed as accurately and completely as possible, using all available data.

Specific projects or ongoing activities with the potential to cumulatively affect the resources (impact topics) evaluated for the project are identified below. Some impact topics would be affected by several or all of the described activities, while others could be affected very little or not at all. How each alternative would incrementally contribute to potential impacts for a resource is included in the cumulative effects discussion for each impact topic.

Population growth in the Las Vegas valley and Laughlin/Bullhead City areas, and increases in area visitation is considered when analyzing the cumulative impacts of the proposed alternatives. Starting in the mid-1980s, annual population increases averaging nearly 7% caused the Las Vegas population to almost double between 1985 and 1995, increasing from about 186,000 to 368,000, a 97% increase. At the same time, Clark County's population increased from 562,000 to 1,036,000, an increase of 84%. The July 2000 population estimate for Las Vegas was 482,874. The latest population prediction in the Las Vegas valley is for two million people by 2005. Between 1990 and 1997, Laughlin population has increased 65% to 7,905. During the same period, Bullhead City population grew 21% to 27,173. As a region, the two communities have a combined population of 35,078, which constitutes a 29% increase since 1990.

With the predicted increases in population in the local area, and continuing visitation from California and Arizona, Lake Mead NRA visitation will continue to increase above the current 8 to 10 million visitors per year. The project site is located just north of one of the busiest developed areas of the recreation area. Katherine Landing visitation in 2001 was more than 1 million visitors. As capacity is reached at Katherine Landing, visitation is expected to spread to other nearby areas, including South Telephone Cove.

Human activities within the recreation area such as the construction, rehabilitation, and maintenance of existing roads, parking lots, buildings, recreational facilities, and utility corridors have disturbed Lake Mead NRA resources in the past. In the Katherine Landing area, there are numerous backcountry roads, several utility corridors, parking lots, fence corridors, recreational facilities and buildings. There are also several mine sites near the project site that have permanently disturbed recreation area resources and the biotic communities at the mine sites. Ongoing

maintenance activities, such as road grading, can result in negligible impacts to Lake Mead NRA resources since the activities are confined to existing roads.

Human activities can disturb recreation area resources presently and in the future. Illegal activities, such as illegal off-road vehicle use, can damage Lake Mead NRA resources, such as soils, vegetation, and cultural sites. The use of motorized vessels, including boats and personal watercraft, and aircraft overflights, can impact the natural quiet and recreation area soundscapes. Because South Telephone Cove is located in an urban park setting, there is an expectation of human-caused noise by the visitor.

ENVIRONMENTAL CONSEQUENCES — NO-ACTION ALTERNATIVE

Biotic Communities

There would be no change to biotic communities (vegetation, wildlife, and threatened, endangered, or sensitive species) should the no-action alternative be implemented. The no-action alternative would result in no change to existing impacts at Boxcar Wash due to construction activities. However, the effect of sediment deposition, scouring, and erosion due to the damming and overtopping events at this site will continue to create disturbed soils, providing a seedbed for exotic plant species such as Russian thistle. There would be no change to existing wildlife impacts at this site under the no-action alternative.

The no-action alternative would result in no change to existing impacts along the Northshore Road segment between MPs 20.8 and 30.3, because no construction activities would occur. Routine maintenance activities would continue, but would be carried out within the existing disturbed road template. Vegetation near an existing turnout would continue to receive negligible to minor, adverse impacts due to trampling, which could affect individual plants and/or cause soil compaction. The existing level of wildlife/vehicle collision impacts would continue and would be expected to increase with increasing traffic volumes related to recreation.

Cumulative Impacts. The no-action alternative is not expected to contribute to cumulative effects on biotic communities or wildlife along the existing roadway. Cumulative impacts to threatened and endangered species and species of special concern are discussed separately below.

Conclusion. There would be no change to impacts on biotic communities or wildlife resulting from implementing the no-action alternative. There would be no cumulative impacts to biotic communities from implementing the no-action alternative.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's general management plan or other

relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to biotic communities from implementing the no-action alternative.

Threatened and Endangered Species, and Species of Concern

Because no construction activities would be undertaken under the no-action alternative, there would be no change in effects to the desert tortoise population near Boxcar Wash or the Northshore Road project segment. The roadway may restrict movement and gene flow between populations of desert tortoise on either side. However, it is likely that desert tortoises often cross the road successfully, or cross beneath the road via culverts, and genetic exchange does occur. Under the no-action alternative, desert tortoises would continue to be subjected to injury and death from vehicle collisions.

The chuckwalla may use the rocky desert, lava rocks, and rock outcrops adjacent to Northshore Road for habitat. Chuckwallas are far more mobile than the desert tortoise, and less restricted in crossing the roadway to colonize and/or breed. The banded Gila monster may use the desert scrub, desert grassland, and rocky areas adjacent to Northshore Road for habitat. As a rather slow-moving lizard, banded Gila monsters would be subject to mortality when attempting roadway crossings; however, the species spends much of its time underground (up to 95%) and is, therefore, less subject to vehicle collision impacts, overall.

Gypsiferous soils occur adjacent to Northshore Road and support the Las Vegas bearpoppy near the project terminus. Because there would be no construction activities near the known Las Vegas bearpoppy population and habitat, there would be no change in impacts to this species, which currently consist of long term, negligible to minor, and adverse due to trampling by visitors using a nearby turnout. Rocky substrates adjacent to the roadway could support Gold Butte moss, seriate crossidium, and Sweet trichostoma. Fine-textured soils of the mixed desert shrub communities, particularly deep, sandy soils stabilized by vegetation or a gravel veneer, could support populations of threecorner milkvetch. These soils, plus sandy soils found in desert washes, on small dunes, in small sand flats, and the road shoulder edge, could provide habitat for sticky buckwheat. The Las Vegas bearpoppy was the only rare plant identified in the project area, to date. However, continued Northshore Road maintenance would reduce reproductive success of any plant species of concern establishing on the road shoulders or turnouts, resulting in no change in effects under the no-action alternative.

Cumulative Impacts. Lake Mead NRA staff plans additional road improvement projects in Lake Mead NRA, including rehabilitation of Callville Bay Road and the remainder of Northshore Road. The lands adjacent to Northshore Road are located within the natural environment or environmental protection subzones, which emphasize conservation of natural resources and provide for environmentally compatible recreational activities. The no-action alternative would not contribute to cumulative effects on threatened or endangered species and species of concern along the existing roadway.

Northshore Road east of Boxcar Wash occupies known habitat of the desert tortoise and Las Vegas bearpoppy. The entire project area occupies potential habitat for the chuckwalla, banded Gila monster, threecorner milkvetch, sticky buckwheat, Gold Butte moss, seriate crossidium, and Sweet trichostoma. Development of private land in the vicinity of Las Vegas and its suburbs, and the associated loss and degradation of desert tortoise habitat, and habitat for the species of concern, is anticipated to continue. Actions on private lands including urban development, recreation, and grazing would continue to contribute to habitat degradation and loss for all species.

The USFWS has issued an incidental take permit, pursuant to section 10(a)(1)(B) of the Endangered Species Act, to Clark County and the cities of Las Vegas, North Las Vegas, Henderson, and Boulder City (24 July 1991). This permit authorizes incidental take of desert tortoises on nonfederal land within permit boundaries. When reviewed within the regional expanse of Clark County, and the geographical extent of the Mojave Desert available for desert tortoise habitat, the impact to the species along Northshore Road would be barely measurable. The cumulative effect of the no-action alternative to the desert tortoise, relative to regional effects outside Lake Mead NRA, would be considered long term, negligible, and adverse. The cumulative effect to the Las Vegas bearpoppy would be confined to maintained areas of gypsiferous soil and would be considered long term, negligible, and adverse relative to regional effects outside Lake Mead NRA. The cumulative effect of the no-action alternative to other species of concern, including the chuckwalla, banded Gila monster, threecorner milkvetch, sticky buckwheat, Gold Butte moss, seriate crossidium, and Sweet tricostemum, would be confined to maintained areas of soil and would be considered long term, negligible, and adverse relative to regional effects outside Lake Mead NRA.

Conclusion. The no-action alternative would not change existing impacts to desert tortoise, chuckwalla, and banded Gila monster populations from vehicle collision, habitat fragmentation, or predation (including by the common raven) along the Northshore Road corridor. The Las Vegas bearpoppy population near the project terminus and near an existing turnout would continue to receive negligible to minor, adverse impacts due to trampling, which could affect individual plants and/or cause soil compaction. For all threatened, endangered, and species of special concern, the determination would be “may affect but not likely to adversely affect.”

Cumulative impacts to threatened and endangered species and species of concern would be long term, negligible, and adverse.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA’s establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA’s *General Management Plan* or other relevant NPS planning documents, there would be no impairment of park resources or values related to threatened and endangered species or species of concern under this alternative.

Floodplains and Water Quality

With the no-action alternative, no change to direct or indirect impacts relative to the narrow floodplains crossing Northshore Road or water quality would result. Northshore Road would continue to have minor, localized, adverse impacts on desert wash flood hydrology due to floodplain alterations from the corrugated metal pipe (CMP) culverts currently in place. Eroding road shoulders and cut-and-fill slopes within the project area would continue to have minor localized effects on water quality as a result of sedimentation and deposition of debris into washes, resulting in a long-term, negligible to minor, adverse effect.

Boxcar Wash is a moderate- to large-sized wash that would periodically carry enough flow and debris to block the inadequate CBC currently in place, and would overtop Northshore Road under the no-action alternative. This condition would result in potential injury to visitors, erosion of roadbed fill, maintenance actions to clean the roadway and repair any damage to guardrails or fill, and deposition of silt/disturbance to fill creating a seedbed for exotic plant species. There would be no change to direct or indirect impacts on the floodplain or water quality of Boxcar Wash under the no-action alternative. Erosion of roadbed fill would continue to have localized, negligible, adverse effects on water quality as a result of sedimentation and deposition of debris into Boxcar Wash.

Cumulative Impacts. There would be no cumulative impacts to floodplains from the no-action alternative.

Other visitor use and facilities in Lake Mead NRA and project area contribute sediments and pollutants to Lake Mead. Other NRA projects (e.g., the *Lake Management Plan* and boat ramp improvements) are planned, and these are likely to have both beneficial and adverse impacts on water quality. The no-action alternative would contribute a localized, negligible, adverse effect to these actions.

Conclusion. There would be no change in impacts to floodplains and water quality from implementing the no-action alternative.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to floodplains and water quality from implementing the no-action alternative.

Air Quality

With the no-action alternative, no change in direct or indirect impacts on air quality would result.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting air quality in the region include the effects of increased development and population growth, most notably in the Las Vegas area. The no-action alternative would not contribute to this development and corresponding impacts to air quality.

Conclusion. There would be no change in impacts to air quality from implementing the no-action alternative.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to air quality from implementing the no-action alternative.

Soils

As no action would be taken in this alternative, construction would not occur and, therefore, there would be no change in direct or indirect impacts on soils.

Cumulative Impacts. There would be no cumulative impacts from implementing the no-action alternative.

Conclusion. There would be no impacts to soils from implementing the no-action alternative. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to soils from implementing this alternative.

Visitor Use and Experience

The no-action alternative would leave the road in its present condition, with tight curves narrow lanes, and gravel shoulders. There would be no change in the number of turnouts. Although it is not anticipated that the road condition would affect visitation numbers, the experience of driving a narrow road while towing a trailer could cause frustration and anxiety to motorists. There would be no change in direct or indirect impacts on visitor experience under this alternative. However, the existing condition of the roadway constitutes a long-term, minor, adverse impact to visitor use and experience.

Boxcar Wash would periodically carry enough flow and debris to block the inadequate CBC currently in place, and would overtop Northshore Road under the no-action alternative. This condition would result in an inconvenience to visitors if the road becomes impassable.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting visitor experience include boat launch lane closures at area marinas due to low water levels and could lead to closure of the boat launches altogether. If the boat launches at Overton Beach, Echo Bay, and/or Callville Bay are closed, the overall use of Northshore Road would most likely be greatly reduced, which would greatly reduce visitation to the area causing a long-term, major, adverse effect. On the other hand, if Overton Beach, Echo Bay, and Callville Bay launches remain open and other boat launches close due to water level reduction, this could increase visitation to these marinas adding to increased traffic and greater congestion, resulting in a long-term (depending on how long conditions last), minor, adverse effect.

Las Vegas area population growth would increase use of Lake Mead NRA and the number of vehicles on Northshore Road, resulting in a long-term, minor, adverse impact on visitor use and experience.

As other segments of Northshore and Callville Bay Roads are improved, the visitor would experience a poorer driving experience along this segment of Northshore Road because the various segments of the road would be inconsistent to the driver resulting in a long-term, adverse, and minor impact.

Conclusion. The no-action alternative would have long-term, minor, adverse impacts on visitor experience. Cumulative effects would be long-term, adverse, and minor.

Health and Safety

The no-action alternative would leave the road in its present condition, with tight curves, narrow lanes, and gravel shoulders. There would be no change to health and safety impacts from implementing the no-action alternative; however, the existing condition of the road constitutes a long-term, moderate, adverse impact.

Boxcar Wash would periodically carry enough flow and debris to block the inadequate CBC currently in place, and would overtop Northshore Road under the no-action alternative. This condition could result in injury to visitors resulting in a long-term, negligible, minor, adverse impact.

There would be no risk to construction workers from flash floods under the no-action alternative.

Cumulative Impacts. The cumulative effect of the no-action alternative, combined with other past and reasonably foreseeable actions affecting health and safety at Lake Mead NRA, include continued reduction in water levels, which could lead to closure of the northern-shore boat launches. If the boat launches are closed, overall use of the marinas would be greatly reduced, resulting in a large traffic volume reduction and, therefore, less potential for accidents along the road resulting in a moderately beneficial impact on health and safety. Closure of other boat launches could lead to an

increase in traffic to northern-shore marinas, which could increase the number of accidents along the road resulting in a long-term (depending on how long conditions last), negligible to minor, adverse impact on human health and safety.

Las Vegas area population growth would increase use of Lake Mead NRA and the number of accidents along the road, resulting in a long-term, negligible to minor, adverse impact on human health and safety.

As other segments of Northshore and Callville Bay Roads are improved, visitors would experience a more dangerous driving experience along this segment of Northshore Road. The various segments of the road would be inconsistent, i.e., travel lane widths, sight distances, and road surfaces, resulting in a long-term, adverse, negligible to minor impact.

Conclusion. Implementation of the no-action alternative would have long-term, negligible to moderate, adverse impacts on human health and safety from increased numbers of driving accidents. Cumulative effects would be long term, adverse, and negligible to minor.

ENVIRONMENTAL CONSEQUENCES—PREFERRED ALTERNATIVE

Biotic Communities

Aspects of this project with the potential to impact biotic communities include minor roadway realignment, lengthening or abandoning turnouts, realigning parking areas, and placement of extended culverts with riprap wing and head walls. Generally, rehabilitation activities such as asphalt removal, sub-excavation of bed material, placement of new bed material, paving the road surface and shoulders, paving the turnouts and adding concrete curbs and gutters would disturb currently paved or graveled surface areas that do not support vegetation and are of no habitat value to wildlife. Construction along the roadway would result in covering about 0.77 acre of sparse desert shrub and desert wash habitat. It is also likely that this project would introduce or spread *brassica tournefortii*, cheatgrass, and other weeds.

Several measures would be taken to mitigate direct and indirect impacts, including selective positioning for equipment staging and material storage, defining construction zones and construction perimeters in the field, and saving and storing desert soil (and the soil seed bank) for restoration/revegetation of areas (primarily one turnout) to be reclaimed (approximately 0.49 acre) within the corridor. Refer to the “Mitigation Measures for the Preferred Alternative” section of the alternatives chapter for a detailed discussion. As a result of implementing this alternative and the mitigation measures discussed, long-term, negligible to minor, adverse impacts on plant communities would be expected.

During construction some wildlife, particularly small mammals and reptiles, would be temporarily displaced. Some individuals would be killed outright or would be dispersed outside the construction limits and be susceptible to predation or competitive stress. This displacement would result in a slight population depression adjacent to the corridor, but following project completion and successful restoration, wildlife would again reoccupy restored portions of the project area. It is likely that certain larger species such as the bighorn sheep and golden eagle would avoid the road corridor during construction. Other large species (i.e., coyote and common raven) may be more visible as prey species are flushed or uncovered during ground disturbance or are made available as carrion. Implementing this alternative is expected to have short-term (duration of the project and revegetation/habitat restoration), negligible to minor, adverse impacts on wildlife.

Cumulative Impacts Human activities within Lake Mead NRA such as the rehabilitation and maintenance of roads, buildings, recreational facilities, and visitor facilities have locally disturbed biotic communities and have the potential to do so in the future. Examples of recent reconstruction and rehabilitation work within Lake Mead NRA include Northshore Road, Lakeshore Scenic Drive, and Callville Bay Road. Short-term impacts to vegetation and wildlife would result from construction and maintenance activities and would be related to human presence, noise and vibration related to construction machinery, vehicles, and activities; dust generation, etc. Long-term impacts to vegetation would result from covering of habitat by the road template, habitat fragmentation, potential for introduction of exotic plant species via vehicles, wildlife/vehicle collisions, etc. The reconstruction and rehabilitation work on Northshore Road, added to other past, present, and future work on transportation corridors in Lake Mead NRA, would be expected to result in short- and long-term, negligible, adverse, cumulative impacts on vegetation and wildlife.

Conclusion. This alternative is expected to have localized, short-term and long-term, negligible to minor, adverse impacts on biotic communities and wildlife in Lake Mead NRA. Cumulative adverse impacts would result for vegetation and wildlife relative to other roadway improvement projects within Lake Mead NRA, including future rehabilitation of Callville Bay Road and the remaining segment of Northshore Road; these are expected to be adverse, short term and long term, and negligible.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to biotic communities from this alternative.

Threatened and Endangered Species, Species of Concern

Impacts to the desert tortoise, relative to the preferred alternative, would be mostly eliminated by the mitigation measures proposed, such as temporary desert tortoise fence placement, construction site monitoring, and construction staff education. As a result of this mitigation, the preferred action is

not likely to adversely affect the desert tortoise. The temporary desert tortoise fence may also help to protect the banded Gila monster and the chuckwalla to some degree. During construction, some harassment of the desert tortoise, chuckwalla, and banded Gila monster would occur from increased levels of human activity, noise, and the ground vibrations produced by vehicles and heavy equipment in the short term. However, long-term impacts to individual desert tortoises, the chuckwalla, and banded Gila monster would return to preconstruction levels following removal of the temporary exclusion fence, resulting in negligible to minor, adverse impacts due to vehicle collisions, and may affect, but is not likely to adversely affect, determination under section 7 of the Endangered Species Act.

Desert tortoise, and to a lesser degree banded Gila monster individuals on the ground surface or in burrows within the construction limits, could be killed or injured by construction vehicles or harassed by removal to a safer location during road rehabilitation work. These activities would result in short-term, minor to moderate, adverse impacts. Desert tortoise eggs could be destroyed. These impacts would be minimized by clearly marking clearing limits outside of the existing road prism and by providing temporary desert tortoise fence to prevent individuals from accessing the construction zone. Desert tortoise surveys would be completed 24 hours prior to construction activities and any burrows present near the project boundary would be avoided, if possible, and protected by fencing. A qualified biologist, in accordance with procedures outlined by the USFWS, would perform any handling of desert tortoises.

Indirect, adverse impacts related to capture or harassment of desert tortoises by construction personnel and attraction of the common raven to the area by trash accumulation could occur over the short term. However, each project employee would be informed of the desert tortoise presence, its threatened status, and the protocol to be used when observations are made. In addition, a litter control program would be implemented during construction, as described under the mitigation section, resulting in a “may affect but is not likely to adversely affect” determination.

The Las Vegas bearpoppy occurs within the project corridor, occupying gypsiferous soils near the turnout (approximately 33 feet from the road shoulder and 65 feet from the turnout) at MP 29.8. Direct impacts to the Las Vegas bearpoppy population at this location would be avoided by placing protective temporary fencing along the edge of the construction zone. Indirect impacts related to dust deposition would occur during construction, resulting in a short-term, negligible to minor, adverse impact to Las Vegas bearpoppy individuals of this population and a “may affect, not likely to adversely affect” determination.

All plant species of concern, i.e., the Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, Gold Butte moss, seriate crossidium, and Sweet trichostomum, would be lost to construction if present within the reconstructed road template or on the fill supporting the Boxcar Wash crossing. This loss would result in localized, long-term, negligible to minor, adverse impacts to individuals and habitat for plant species of concern. These habitats include predominantly sandy, but some gypsiferous soils within the corridor. A survey would be conducted to determine the presence/absence of rare plant species and desert soils would be placed on a site near the point of origin, ensuring that gysophile (Las Vegas bearpoppy, Gold Butte moss, seriate crossidium, and Sweet

trichostomum) seeds and spores would be returned to a similar habitat and the threecorner milkvetch and sticky buckwheat would be returned to sandy desert soils, including sand, cobble, and randomly strewn boulders. Because desert soil salvage could result in the retention of seeds and spores for these species, upon its reintroduction to an obliterated turnout, would result in a localized, long-term, slightly beneficial effect to the plant species of concern.

Cumulative Impacts. Reconstruction of the Northshore Road segment would occur within lands located in the natural environment or environmental protection subzones of Lake Mead NRA, which emphasize conservation of natural resources and provision for environmentally compatible recreational activities. In the long term, impacts to the desert tortoise resulting from Northshore Road rehabilitation and minor reconstruction, and from future projects on Northshore Road would be similar to those that occur today because the roadway would remain unfenced. This would result in a long-term, negligible to minor, adverse, cumulative impact to the regional desert tortoise population, resulting in a "may affect but not likely to adversely affect" determination. During the construction of any single roadway rehabilitation project, impacts to the desert tortoise would be localized, short term, negligible, and adverse. This action would have a long-term, negligible, adverse, cumulative impact to the desert tortoise population east of the city of Las Vegas, in Clark County. The development of private land in the vicinity of Las Vegas and its suburbs and the associated loss and degradation of desert tortoise habitat is expected to continue into the future. Actions on private lands such as urban development, recreation, and grazing would continue to contribute to habitat degradation and loss for the desert tortoise.

The USFWS issued an incidental take permit pursuant to section 10(a)(1)(B) of the Endangered Species Act to Clark County and the cities of Las Vegas, North Las Vegas, Henderson, and Boulder City (24 July 1991). This permit authorizes incidental take of desert tortoises on nonfederal land within the permit boundaries. When reviewed within the regional expanse of Clark County and the geographical extent of the Mojave Desert habitat available for the desert tortoise population, the beneficial impact realized along the rehabilitated portion of Northshore Road would be small, resulting in a long-term, slightly beneficial, cumulative effect.

Conclusion. Approximately 0.5 acre of low-density (bordering moderate density) desert tortoise habitat would be permanently lost adjacent to the existing roadway. This habitat contained some desert tortoise sign observed during a survey conducted in 2002. The affected habitat includes desert wash and sparse desert shrub. Approximately 0.27 acre of previously disturbed habitat would be revegetated adjacent to the existing roadway, primarily on an obliterated, existing turnout. Road use would continue to result in depressed desert tortoise numbers immediately adjacent to the road due to vehicle collisions. The Las Vegas bearpoppy population near MP 29.8 would be protected from impacts related directly to construction activity, but would receive impacts due to dust deposition due to dust generated during roadway rehabilitation activities, resulting in a "not likely to adversely affect" determination.

The preferred alternative is expected to result in localized, short-term, negligible, adverse impacts on the desert tortoise and Las Vegas bearpoppy during construction. Following construction, long-term, negligible to minor, adverse impacts would result to the desert tortoise, which would be subject to

existing levels of traffic hazards, including vehicle collisions resulting in injury or death. There would be no long-term effect to the Las Vegas bearpoppy population, although short-term, negligible to minor, adverse effects resulting from dust deposition during construction would occur. Other species of concern, if present in the project corridor, would receive localized, long-term, negligible to minor, adverse impacts on potential habitat for the chuckwalla, banded Gila monster, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, Gold Butte moss, seriate crossidium, and Sweet trichostomum.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to threatened and endangered species, species of concern, or designated critical habitat associated with this alternative.

Floodplains and Water Quality

Section 404 is a permitting process under the Clean Water Act, which authorizes the U.S. Army Corps of Engineers to prohibit or regulate discharging dredged or fill material into waters of the United States. Ephemeral washes are considered waters of the United States, even though desert washes in the project area are dry much of the year. They flood occasionally during the late summer monsoon season. Approximately 1,962-cubic yards (1,500-cubic meters) of fill, primarily riprap and earth removed from elsewhere on the project, would be placed within dry wash channels along rehabilitated and reconstructed segments of Northshore Road. This amount of fill is the minimum necessary to ensure proper protection and functioning of CMP culverts and meet the project objective of improving the road for traffic safety.

A permit from the U.S. Army Corps of Engineers for minor discharges of dredged or fill material into waters of the United States would be required, pursuant to section 404 of the Clean Water Act. The U.S. Army Corps of Engineers would consider each crossing as a complete and separate project; therefore, the culvert work would meet the threshold requirements of Nationwide Permit #14, and would be authorized under this permit.

The rehabilitated Northshore Road would cross small, narrow washes at several locations. The larger Boxcar Wash would only be crossed at one location, requiring a temporary detour road across the wash, but no additional fill material would be added to the existing template. CMP culverts would allow water to flow under Northshore Road within the washes during precipitation events resulting in runoff, but the form and flow dynamics of the channel would be somewhat altered by the fill material. Assuming correct installation and sizing of the CMP culverts, there would be no chronic, adverse impacts to the floodplain. In the short term, there would be minor, increased, localized erosion (particularly along desert wash margins) and sedimentation, a short-term, minor, adverse impact.

Erosion and sedimentation are also the most important processes related to water quality impacts of this proposed road rehabilitation project. Erosion occurs when sediments, i.e., soil particles, gravel, small rocks, etc., are picked up and carried in moving water during and immediately following precipitation events. Depending on the amount of water present, the sediments carried by runoff and floodwaters would eventually be deposited farther along the desert wash, or they may be carried all the way to Lake Mead. In these arid environs, some degree of erosion and sedimentation is normal, but the amount increases and the process accelerates when desert soils are loosened or otherwise disturbed due to construction activities and recreational activities such as illegal off-road driving. Minor sedimentation also results from eolian action, when wind transports dust and sand to waterways or directly into receiving water bodies such as Lake Mead.

The project corridor would be most vulnerable to sedimentation and erosion during construction due to exposure of cut slopes, topsoil, fill material, and disturbed and compacted surfaces to natural elements. Following construction, road surfaces would be paved and slopes and fill stabilized. Rainstorms are most likely during the monsoon season or during July, August, and early September. Project construction activities would be conducted during the non-monsoon season, to the extent possible, to avoid flash flood events that would exacerbate erosion and sedimentation impacts.

Using best management practices for controlling nonpoint source pollution during construction would control sedimentation and erosion during small storm events. Should a major precipitation event occur during construction, however, sediments could be carried to Lake Mead and contribute to water turbidity (cloudiness) in the lake. Turbidity, if severe, can reduce light penetration, visibility, and dissolved oxygen levels, affect aquatic organisms, and reduce the ability of predatory fish and birds to see prey. The waters would also be less attractive for recreation, and sediments can fill reservoirs and block water intakes. Depending on the extent to which storm events did not occur during road construction, short-term, negligible to minor, adverse impacts on water quality from increased erosion, sedimentation, and turbidity would result.

A small amount of fill that was placed in Boxcar Wash when the road was originally constructed would be removed to allow placement of an additional CBC. This removal allows freer flows of the wash under Northshore Road, but does not restore the channel bottom structure (the CBC has a concrete bottom). Fill removed from the wash channel would likely be used to repair the eroded areas along the approaches to this crossing, resulting from the past, overtopping flood event. This action would constitute a long-term, negligible, slightly beneficial effect.

Cumulative Impacts. Additional floodplain and water quality impacts would result from construction related to future projects on Northshore Road, past construction projects on Northshore Road and on Lakeshore Road, construction of the Callville Bay Road project, other visitor uses and facilities in Lake Mead NRA, and other NRA projects such as the *Lake Management Plan* and boat ramp improvements. These would all result in the contribution of sediments and pollutants into desert wash and the Lake Mead environment. These actions, in combination with the proposed action, would likely have cumulative impacts on water quality that would be both adverse and beneficial. The cumulative effect of the preferred alternative on floodplains and water quality, in

combination with other past, present, and reasonably foreseeable future events, would be short term, negligible, and adverse.

Conclusion. The preferred alternative would have minor, short-term, localized, adverse impacts on floodplains. Impacts on water quality would be short term, negligible to minor, and adverse, depending on the extent to which construction could be conducted without a major storm event during construction activities. Cumulative impacts would be short term, negligible, and adverse.

The project would be authorized under U.S Army Corps of Engineers Nationwide Permit #14, for minor discharges of dredged or fill material into waters of the United States, pursuant to section 404 of the Clean Water Act. Compliance with Executive Order 11988 (*Floodplain Management*) is not required for this project because entrance, access, and internal roads to or within units of the National Park Service are excepted actions (NPS 1993). Thus a statement of finding for floodplains will not be prepared.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's general management plan or other relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to floodplains or water quality from this alternative.

Air Quality

The preferred alternative would temporarily affect local air quality through increased dust and vehicle emissions. Hydrocarbons, nitrous oxide, and sulfur dioxide emissions would be largely dispersed by prevailing winds in the project area. Dust stirred up by construction equipment would increase airborne particulates intermittently, but this phenomenon is not expected to be appreciable. Mitigating measures such as water sprinkling to reduce dust and limit idling of construction equipment would be used, as appropriate, to mitigate effects. Impacts from dust and construction equipment emissions would be localized, short term, minor, and adverse.

Cumulative Impacts. Air quality at Lake Mead NRA is affected by a variety of internal and external factors such as power plants, motor vehicle emissions, and urban industrial sources. Long distance transport of pollutants, which would be unaffected by the preferred alternative and reasonably foreseeable actions, would continue into the future with anticipated emission levels remaining similar to existing levels. Impacts to air quality from other construction projects would be short term, lasting only as long as the construction, negligible to minor, and adverse. The short-term, minor impacts associated with the preferred alternative, in conjunction with the effects of reasonably foreseeable actions, would result in short-term, negligible to minor, adverse effects. The intensity of effects would depend on the number and timing (i.e., if they are simultaneous) of construction activities.

Conclusion. Overall, there would be minor, short-term degradation of air quality from construction-generated dust and emissions from construction equipment. Cumulative effects would be negligible and adverse.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to air quality from this alternative.

A dust control permit from Clark County, Nevada Health District, Air Pollution Control Division, would be required.

Soils

Soils of the project corridor consist of sand and gravel stabilized by desert pavement, eolian sands, and fine-grained, gypsiferous clays. Most of the construction activities would be conducted on previously disturbed soils that comprise the existing roadbed and have been compacted by years of maintenance and motor vehicle passage. The Northshore Road template within the project area currently covers approximately 40 acres (approximately 16 hectares). The total area disturbed for the rehabilitation project, including previously and newly disturbed land would be 40.87 acres (16.2 hectares). The total amount of previously undisturbed soil permanently affected by construction would be approximately 0.77 acre (0.3 hectare).

About 0.49 acre (0.19 hectare) of previously disturbed ground surface (former turnout and roadway) would be restored and revegetated. Restoration and revegetation efforts would reduce scarring and loss of soil through erosion. Natural soil processes would be restored only over the long term, as soil structure slowly returns to a more natural condition in this desert environment.

No blasting activities should be required; however, some trampling and soil compaction by equipment and workers within the construction zone is expected. Soils occupying much of the construction zone have been previously disturbed by road-related activities. Local soil compaction would temporarily decrease permeability, alter soil moisture content, and diminish the water storage capacity of these generally xeric soils. Surface disturbance to desert soils would also increase susceptibility to erosion during precipitation events. Construction activities associated with the preferred alternative would have long-term, negligible, adverse impacts on desert soils.

Cumulative Impacts. Desert soils in surrounding communities and other developing areas of Clark County are being affected in some areas by construction activities and development associated with regional population growth. Desert soils within Lake Mead NRA are generally protected; however, illegal off-road vehicle use and construction activities are the principal causes of soil impacts. Lake Mead NRA staff is using preventative measures to minimize future soil impacts. Additional

foreseeable construction would result in new impacts on soils; these activities are located along other segments of Northshore Road, Callville Bay Road, developed areas at Stewart's Point, and in Eldorado Canyon (NPS 2002), and would have cumulative impacts on desert soils. The long-term, negligible, adverse impacts on desert soils from the preferred alternative, in combination with the effects of current and reasonably foreseeable actions, would result in long-term, minor, adverse, cumulative effects.

Conclusion. Overall, soil impacts associated with the preferred alternative are expected to be long term, negligible, and adverse because they are localized. Cumulative impacts would also be long term, negligible, and adverse.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Lake Mead NRA's establishing legislation, (2) key to the natural or cultural integrity of the recreation area or to opportunities for enjoyment of the recreation area, or (3) identified as a goal in Lake Mead NRA's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of Lake Mead NRA resources or values related to soils or geologic resources from this alternative.

Visitor Use and Experience

During construction work on Northshore Road, visitors would experience up to 15-minute delays along the roadway, partial closure of parking lots, and a reduced number of turnouts used for staging areas. Mitigation measures specified in the construction contract include no work from one day before the holiday weekend through one day after the weekend, except for work that would not impact visitor ingress/egress to recreation facilities; and no work on the weekends. These measures would reduce impacts during the high-use periods. Short-term impacts would be minor and adverse in nature, since construction would take place during low visitation periods. If the project extends into peak season or into weekends, the impacts would be moderate.

Upon completion of the preferred alternative, increased sight distances and wider travel lanes would improve driving conditions. Although it is not anticipated that the road condition would have any impact on visitation numbers, the driving experience would be improved resulting in a long-term, minor, beneficial effect.

The number of turnouts along Northshore Road would be reduced by one; however, sight distances would be increased making egress easier. Therefore, long-term effects would be minor to moderately beneficial in nature.

Boxcar Wash would be adequate for a 50-year storm event and less likely to top over the road and result in a long-term moderately beneficial effect on visitor use.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting visitor experience include boat launch lane closures at northern-shore marinas due to low water levels, and could lead

to closure of the boat launches altogether. If the boat launches at Overton Beach, Echo Bay, and/or Callville Bay are closed, the overall use of Northshore Road would most likely be reduced, which would greatly reduce recreational opportunities in the area causing a long-term, moderate to major, adverse effect. On the other hand, if Overton Beach, Echo Bay, and Callville Bay launches remain open and other boat launches close due to low water levels, this could increase visitation to these marinas adding to increased traffic and greater congestion, resulting in a long-term (depending on how long conditions last), minor to moderate, adverse effect.

Las Vegas area population growth would increase use of Lake Mead NRA and the number of vehicles on Northshore Road, resulting in a long-term, minor, and adverse impact on visitor experience as traffic, use, and congestion continue to increase.

As other segments of Northshore and Callville Bay Roads are improved, the visitor would experience a consistent driving experience along this segment of Northshore Road, resulting in a long-term, moderately beneficial effect on visitor use.

The long-term, minor to moderately beneficial effects on visitor use and experience from the preferred alternative, in combination with the effects of current and reasonably foreseeable action, would result in long-term, minor, beneficial effects.

Conclusion. The preferred alternative would have minor adverse impacts on visitor experience in the short term, but minor to moderately beneficial effects for the long term. The cumulative effects of the preferred alternative, combined with other reasonably foreseeable actions, would be long term, minor to major, adverse, cumulative impacts to visitor experience, while overall road improvements would be moderately beneficial.

Health and Safety

During the rehabilitation of Northshore Road, speeds would be reduced in construction zones, resulting in fewer and less severe accidents in these segments. This would result in a short-term, slightly beneficial effect to health and safety.

If the project were completed from October through June, there is little adverse risk to worker safety related to desert washes and flash floods. However, if the project is extended into July, August, and September, there is a greater risk of flash flooding. If this occurs, the construction contractor would be required to implement a safety plan for working in desert washes. With the application of a safety plan, the increased risk would be negligible adverse risk to worker safety related to desert washes and flash floods.

Upon completion of the preferred alternative, increased sight distances and wider travel lanes on Northshore Road would improve driving conditions. Drivers would be able to better anticipate road conditions and would be less likely to drop their vehicles off the road edge by accident, thereby maintaining control of their vehicles and reducing accidents. Roadside turnouts would have greater

sight distances making egress safer. A 1995 traffic safety study found that similar project work on the southern portions of Northshore Road resulted in a 68% reduction in the numbers of accidents. The paving of the shoulders, as well as adding rumble strips, is believed to be the primary cause of lowering the accident rate. The road improvements would have a long-term, moderately beneficial effect to health and safety.

Boxcar Wash would be adequate for a 50-year storm event resulting in a long-term, somewhat beneficial effect on health and safety.

Cumulative Impacts. The cumulative effect of the preferred alternative, combined with other past and reasonably foreseeable actions affecting health and safety at Lake Mead NRA, include continued reduction in water levels at Lake Mead NRA, which could lead to closure of the northern-shore boat launches. If the boat launches are closed, overall use of the marinas would be greatly reduced, resulting in a large traffic volume reduction and, therefore, less potential for accidents along the road, resulting in a moderately beneficial impact on health and safety. Closure of other boat launches could lead to an increase in traffic to northern-shore marinas, which could increase the number of accidents along Northshore Road resulting in a long-term, minor, adverse impact on human health and safety.

Las Vegas area population growth would increase use of Lake Mead NRA and the number of accidents along the road resulting in a long-term, minor, and adverse impact on human health and safety.

As other segments of Northshore and Callville Bay Roads are improved, the visitor would experience a more consistent driving experience along this segment of Northshore Road, resulting in a long-term, moderately beneficial effect on health and safety.

Conclusion. The preferred alternative would have a long-term, moderately beneficial effect on health and safety. The cumulative effect on human health and safety would be long term, and range from moderately beneficial to minor, and adverse.

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- Presidential Memorandum of April 29, 1994 "Government-to-Government Relations with Native American Tribal Governments," 59 FR 85.
- Clean Air Act, as amended, PL Chapter 360, 69 Stat. 322, 42 USC § 7401 *et seq*.
- Endangered Species Act of 1973, as amended, PL 93-205, 87 Stat. 884, 16 USC § 1531 *et seq*.
- Executive Order 11988: Flood Plain Management, 42 FR 26951, 3 CFR 121 (Supp 177).
- Executive Order 11990: Protection of Wetlands, 42 FR 26961, 3 CFR 121 (Supp 177).
- Executive Order 11991: Protection and Enhancement of Environmental Quality.
- Farmland Protection Policy Act of 1982, PL 97-98.
- Federal Water Pollution Control Act (commonly referred to as Clean Water Act), PL 92-500, 33 USC § 1251 *et seq*., as amended by the Clean Water Act, PL 95-217.
- Fish and Wildlife Coordination Act of 1958, as amended, PL 85-624, 72 Stat. 563, 16 USC § 661 *et seq*.
- National Environmental Policy Act of 1969, PL 91-190, 83 Stat. 852, 42 USC § 4321 *et seq*.
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- Soil and Water Resources Conservation Act of 1977.
- Watershed Protection and Flood Prevention Act, PL 92-419, 68 Stat. 666, 16 USC § 100186.

CONSULTATION AND COORDINATION

A press release was distributed in November 2002, requesting scoping comments related to the Callville Bay access road project. No comments were received.

Agencies and organizations contacted for information that assisted in identifying issues, or that will be given an opportunity to review and comment on this EA include:

FEDERAL AGENCIES

Bureau of Indian Affairs
Bureau of Land Management: Nevada and Arizona
Bureau of Reclamation
Environmental Protection Agency
Federal Highway Administration
Natural Resources Conservation Service
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
U.S. Forest Service

STATE AND LOCAL INDIVIDUALS AND AGENCIES OF NEVADA

Honorable Kenny Guinn, Governor
Honorable John Ensign, United States Senator
Honorable Harry Reid, United States Senator
Honorable Shelley Berkley, United States Representative
Chamber of Commerce: Las Vegas and Boulder City
City of Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Clark County
Colorado River Commission
Department of Administration, State Clearinghouse
Department of Transportation
Division of Parks
Division of Wildlife
Division of Environmental Protection
Division of Forestry
Division of Historic Preservation and Archaeology
Land Use Planning Advisory Committee
Regional Transportation Commission, Las Vegas
State Historic Preservation Office

LIBRARIES

Boulder City, Nevada
Clark County Community College
Clark County, Nevada
Las Vegas, Nevada
Mesquite, Nevada
Overton, Nevada
University of Arizona, Tucson
University of Nevada Las Vegas

NATIVE AMERICAN TRIBES

Las Vegas Band of the Southern Paiute
Moapa Band of the Southern Paiute
Pahrump Band of the Southern Paiute

OTHER GROUPS AND INDIVIDUALS

Citizen Alert
Defenders of Wildlife
Desert Tortoise Council
Desert Research Institute
Earth First!
East LV Citizens' Advisory Council
Environmental Defense Fund
Environmental Forum
Fraternity of the Desert Bighorn
Friends of Nevada Wilderness
Grand Canyon Trust
Lake Mead Concessioners
Las Vegas Jeep Club
Mule Deer Foundation
The Nature Conservancy
Nevada Chapter
Nevada Conservation Forum
Nevada Wildlife Federation
Red Rock Audubon Society
Sierra Club
Sierra Club-Toiyabe Chapter
Southern Nevada Clean Communities, Inc.
Southern Nevada Environmental Forum
Mr. Dale A. Stirling
The Wilderness Society CA / NV
The Wildlife Society

THREATENED AND ENDANGERED SPECIES

Consultation and coordination relative to the federally listed desert tortoise and species of special concern, e.g., chuckwalla, banded Gila monster, Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat were accomplished, as follows:

- The USFWS has provided a species list for Lake Mead NRA under the Lake Mead National Recreation Area Lake Management Plan and Environmental Impact Statement (24 May 2001, File No. 1-5-01-SP-504), in response to a letter from the National Park Service dated 24 April 2001.

- The Nevada Natural Heritage Program was contacted via e-mail and facsimile and information requested by e^2M, 7 October 2002. They replied with a response letter on 8 October 2002.

- A field survey for desert tortoise within the proposed project corridor was conducted by the Lake Mead NRA wildlife biologist July 2002.

- A biological assessment addressing federally threatened and endangered species was prepared by the Lake Mead NRA and submitted to the USFWS during December 2002.

PREPARERS

This environmental assessment was prepared by engineering-environmental Management, Inc. (e^2M) under the direction of Mr. William K. Dickinson, Superintendent, Lake Mead NRA. Mr. Dickinson and Lake Mead NRA staff, especially Mike Boyles, Steve Daron, Nancy Hendricks, Dale Melville, Elizabeth Powell, and Chanteil Walter, provided invaluable assistance in the development and technical review of this environmental assessment. Jeff Bellen, Federal Highway Administration, provided assistance with roadway and culvert design. The preparers of this document are listed below:

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Years of Experience: 3

Wanda Gray, Technical Publications Specialist
Two years undergraduate study
Years of Experience: 25

APPENDIX A: NATIONAL PARK SERVICE PRESS RELEASE

National Park Service
U.S. Department of the Interior

Lake Mead
National Recreation Area

601 Nevada Highway
Boulder City, NV 89005

702 293-8907
702 293-8936

Lake Mead NRA News Release

November 6, 2002
For Immediate Release
Karla Norris, 702-293-8947
Karla_Norris@NPS.gov

Public Input Solicited for Projects at Lake Mead National Recreation Area

Superintendent William K. Dickinson announced today that the National Park Service is currently soliciting input for several projects proposed at Lake Mead National Recreation Area. Public input is sought to develop feasible alternatives and formulate issues related to the following projects:

The rehabilitation of the Northshore Road, from mile marker 20.8 to 30.3
Improvements to the Willow Beach, Arizona, waste water treatment facility
Reconstruction of a picnic area at South Cove, Arizona
Rehabilitation of the Roger's Spring picnic facility
Extension of the River Mountain Loop Trail within the boundaries of the recreation area
Placement of wayside exhibits along existing roadways in the recreation area
Realignment of South Telephone Cove Road, Arizona.

The National Park Service will be analyzing these proposals in accordance with the National Environmental Policy Act (NEPA) of 1969. The projects will each be evaluated in separate environmental documents.

Written comments on the projects should be received by December 6, 2002. To submit written comments, or to be included on the project mailing list, please write to: Superintendent, Lake Mead National Recreation Area, Attention: Environmental Compliance Specialist, 601 Nevada Way, Boulder City, Nevada 89005.

For further information on any of the listed projects, please contact Environmental Compliance Specialist Nancy Hendricks at (702) 293-8756.

Lake Mead National Recreation Area is a unit of the National Park Service.

-NPS-

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APPENDIX B: LETTER FROM U.S. FISH AND WILDLIFE SERVICE

United States Department of the Interior

JAN 0 9 2003

FISH AND WILDLIFE SERVICE
NEVADA FISH AND WILDLIFE OFFICE
1340 FINANCIAL BOULEVARD, SUITE 234
RENO, NEVADA 89502

December 6, 2002
File No. 1-5-03-SP-432

Memorandum

To: Superintendent, Lake Mead National Recreation Area, National Park Service, Boulder City, Nevada

From: Field Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Species List for the Proposed Northshore Road Rehabilitation

This responds to your letter dated October 23, 2002, requesting information on threatened and endangered species and species of concern that *may* occur in the subject project area. We have enclosed a list of threatened and endangered species that *may* be present within the vicinity of, or be affected by, the proposed project (Enclosure A). This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act), for projects that are authorized, funded, or carried out by a Federal agency. Please reference the species list file number on Enclosure A in all subsequent correspondence concerning this project.

Enclosure A also lists the species of concern to the Nevada Fish and Wildlife office that *may* occur in the project area. We have used information from State and Federal agencies and private sources to assess the conservation needs and status of these species. Further biological research and field study are needed to resolve the conservation status of these taxa. One potential benefit of considering these species during project planning, is that by exploring alternatives early in the planning process, it may be possible to provide long-term conservation benefits for these species and avoid future conflicts that could otherwise develop. We also recommend that you contact the Nevada Natural Heritage Program (1550 East College Parkway, Suite 145, Carson City, Nevada 89710, 775-687-4245) and the appropriate regional office of the Nevada Division of Wildlife, as well as other local, State, and Federal agencies for distribution data and information on conservation needs on these and other species of concern that may occur in your project area. Potential impacts to species of concern should be considered during the environmental documentation process.

The National Park Service is proposing to rehabilitate the Northshore Road on the Lake Mead National Recreation Area, Clark County, Nevada. This would include widening the road and corridors by 10 feet, realigning high-accident curves, redesigning pullouts and adding or removing guardrails. Based on the information provided in your correspondence, the proposed project is within the range of the desert tortoise (*Gopherus agassizii*) a species listed as threatened under the Act. In addition, southwestern willow flycatcher (*Empidonax traillii extimus*), Yuma clapper rail (*Rallus longirostrus yumanensis*), and bald eagle (*Haliaeetus leucocephalus*) may occur within the vicinity of the project. From the project description provided in your correspondence, it appears that part of the proposed project is within the same watershed as critical habitat that has been designated for the razorback sucker *(Xyrauchen texanus*). Potential impacts of the proposed project to this species may include deposition of eroded materials or contaminants, resulting from construction or long-term use. The final rule for the designation of critical habitat for the razorback sucker was published in the Federal Register on March 21, 1994 (59 FR 13374). Modification to critical habitat should be considered when determining the effects of the proposed project.

Enclosure B provides a discussion of the responsibilities Federal agencies have under section 7(c) of the Act and the conditions under which a biological assessment must be prepared by the lead Federal agency or its designated non-Federal representative. If the proposed project is authorized, funded, or carried out by a Federal agency, and if it is determined that a listed species may be affected by the proposed projects, the Federal agency should initiate consultation pursuant to 50 CFR § 402.14. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to a listed species. If a biological assessment is required, and it is not initiated within 90 days of your receipt of this letter, you should informally verify the accuracy of this list with our office. If, through informal consultation or development of a biological assessment, or both, you determine that the proposed action is not likely to adversely affect the listed species, and the Service concurs in writing, then the consultation process is terminated and formal consultation is not required.

We recommend land clearing (or other surface disturbance) be timed to avoid potential destruction of active bird nests or young of birds that breed in the area. Such destruction may be in violation of the Migratory Bird Treaty Act (MBTA) (15 U.S.C. 701-718h). Under the MBTA, active nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If active nests are located, or if other evidence of nesting (mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Superintendent File No. 1-5-03-SP-432

Because this project crosses wash areas, we ask that you be aware of potential impacts project activities may have on waters of the United States. Discharge of dredged or fill material into wetlands or waters of the United States is regulated by the Army Corps of Engineers pursuant to section 404 of the Clean Water Act. We recommend you contact the Regulatory Section of the Army Corps of Engineers' St. George Regulatory Office (321 North Mall Drive, Suite L-101 St. George, UT 84790-7314, 435-986-3979) regarding the possible need for a permit.

Please contact Shawn Goodchild of the Southern Nevada Field Office, at 702-515-5230, if you have questions regarding this correspondence.

Sincerely,

Cynthia T. Martinez

for Robert D. Williams
Field Supervisor

Enclosures

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ENCLOSURE A

LISTED SPECIES AND SPECIES OF CONCERN THAT MAY OCCUR WITHIN THE PROPOSED NORTHSHORE ROAD REHABILITATION PROJECT, CLARK COUNTY, NEVADA

File Number: 1-5-03-SP-432
December 6, 2002

Listed Species

Reptile	
Desert tortoise (T)	*Gopherus agassizii*
Fish	
Bonytail chub (E)	*Gila elegans*
Razorback sucker (E)	*Xyrauchen texanus*
Birds	
Yellow-billed cuckoo (C)	*Coccyzus americanus*
Southwestern willow flycatcher (E)	*Empidonax traillii extimus*
Bald eagle (T)	*Haliaeetus leucocephalus*
Yuma clapper rail (E)	*Rallus longirostrus yumanensis*

T = Threatened
E = Endangered
C = Candidate

Species of Concern

Mammals	
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*
Spotted bat	*Euderma maculatum*
Greater western mastiff-bat	*Eumops perotis californicus*
Allen's big-eared bat	*Idionycteris phyllotis*
California leaf-nosed bat	*Macrotus californicus*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Cave myotis	*Myotis velifer*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Big free-tailed bat	*Nyctinomops macrotis*

ENCLOSURE A (continued)
File Number: 1-5-03-SP-432
December 6, 2002

Species of Concern (Continued)

Birds	
Western burrowing owl	*Athene cunicularia hypugea*
Black tern	*Chlidonias niger*
American peregrine falcon	*Falco peregrinus anatum*
Blue grosbeak	*Guiraca caerulea*
Least bittern	*Ixobrychus exilis hesperis*
Phainopepla	*Phainopepla nitens*
White faced ibis	*Plegadis chihi*
Vermilion flycatcher	*Pyrocephalus rubinus*
Lucy's warbler	*Vermivora luciae*
Arizona Bell's vireo	*Vireo bellii arizonae*
Reptiles	
Banded Gila monster	*Heloderma suspectum cinctum*
Chuckwalla	*Sauromalus obesus*
Fish	
Flannelmouth sucker	*Catostomus latipinnis*
Roundtail chub	*Gila robusta*
Amphibian	
Relict leopard frog	*Rana onca*
Plants	
Las Vegas bearpoppy	*Arctomecon californica*
Three-corner milkvetch	*Astragalus geyeri* var. *triquetrus*
Las Vegas catseye*	*Cryptantha insolita*
Sticky buckwheat	*Eriogonum viscidulum*

* Taxa presumed extinct

ENCLOSURE B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7 (a) and (c) OF THE ENDANGERED SPECIES ACT

SECTION 7 (a); Consultation/Conference

Requires:

1) Federal agencies to utilize their authorities to carry out programs to conserve **endangered and threatened species;**

2) Consultation with the Fish and Wildlife Service (Service) when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species or critical habitat;

3) Conference with the Service when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7 (c): Biological Assessment - Major Construction Activity 1/

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action on listed and proposed species. The process begins with a Federal agency requesting from the Service a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with the Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA:

1. An onsite inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat are present.

2. A review of literature and scientific data to determine species distribution, habitat needs, and other biological requirements.

3. Interviews with experts, including those within the Service, State conservation departments, universities, and others who may have data not yet published in scientific literature.

4. An analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat.

5. An analysis of alternative actions considered.

6. Documentation of study results, including a discussion of study methods used, any problems encountered, and other relevant information.

7. Conclusion as to whether or not a listed or proposed species will be affected.

Upon completion, the BA should be forwarded to our office with a request for consultation, if required.

1/ A construction project (or other major undertaking having similar physical impacts) is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332 (2) C).

APPENDIX C: BIOLOGICAL ASSESSMENT EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This biological assessment addresses the threatened desert tortoise (*Gopherus agassizii*), listed by the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act of 1973, as amended, relative to the Rehabilitate Northshore Road (Milepost 20.8–30.3) Project located at Lake Mead National Recreation Area , Clark County, Nevada. Although the project currently ends at Milepost 28.7, it may be lengthened depending on additional funding becoming available. This biological assessment addresses impacts to the MP 30.3 limit. In addition, the Las Vegas bearpoppy (*Arctomecon californica*) and sticky ringstem (*Anulocaulis leisolenus*), both federal species of concern, are present and have also been addressed relative to this proposed road rehabilitation project. Northshore Road is proposed to be rehabilitated to improve poor pavement condition, deteriorated and inadequate drainage infrastructure, provide adjustments to the existing alignment, and curve widening for safety reasons. A hydrological analysis was conducted to determine hydraulic capacity of a 10-foot x 10-foot concrete box culvert in Boxcar Wash, west of the Callville Bay Road intersection with Northshore Road (approximately Milepost 10.5). Recommendations in the hydrologic study for correcting the undersized culvert include placing an additional concrete box culvert under the road at this site.

Rehabilitation would occur along the entire 9.5-mile-long road segment in the same manner as adjoining Northshore Road projects. The existing roadway would be rehabilitated from two 12-foot paved travel lanes and two 4-foot gravel shoulders (32-foot total width), to two 12-foot paved travel lanes and two 4-foot paved shoulders (32-foot total width). This work would include:

- removing the existing asphalt road surface, re-grading and compacting the roadbed, and resurfacing the road with asphalt,
- adding asphalt shoulders,
- widening curves in high accident locations,
- abandoning or relocating turnouts and paving turnouts,
- installing guardrail at selected sites, and
- installing curb and gutter at turnouts and limiting disturbance of existing slopes.

The emergency phone and Redstone parking areas, located at approximately Mileposts 25.0 and 27.0, respectively, would also be considered for relocation or realignment to allow for better vehicle access, circulation and parking, and the installation of wayside exhibits.

Two alternatives were evaluated, the no action and the preferred action, e.g., rehabilitate Northshore Road and repair the drainage under Northshore Road at Boxcar Wash. The no-action alternative would result in no changes to the existing roadway or Boxcar Wash and consequently, no additional impact, i.e., only maintenance activities would be carried out on an as-needed basis.

Under the preferred action, roadway safety issues related primarily to sight distance and flooding following runoff events would not be addressed. Roadway and drainage rehabilitation and repair would address the safety issues and would also allow placement of temporary desert tortoise fencing to keep desert tortoise from crossing the roadway during construction; the fencing would force them to cross underneath the roadway using culverts. Following construction, the temporary desert tortoise fencing would be removed to restore the scenic quality of this remote area of the National Recreation Area.

During 2002, two field surveys were conducted by the National Park Service to determine desert tortoise presence and habitat quality. The surveys were conducted at the Boxcar Wash crossing and the Northshore Road segment proposed for rehabilitation. Suitable habitat was not identified at Boxcar Wash. Signs of desert tortoise activity were observed within the Northshore Road corridor, including burrows, scat, and a single desert tortoise carcass consisting of scutes and bone; however, no live individuals were observed (USDI-NPS 2002). Desert tortoise habitat along this portion of Northshore Road was considered to be adequate to support only a low-density population. The Las Vegas bearpoppy, a federal plant species of concern, was observed within the Northshore Road corridor, i.e., the closest population was observed on gypsiferous soils approximately 10 meters from the road shoulder and approximately 20 meters from a turnout. All exposures of gypsiferous soils along Northshore Road were examined for the Las Vegas bearpoppy during 2002. Sticky ringstem is likely present on gypsiferous exposures, but was not recorded during field surveys. The sunray, a Clark County evaluation species under the Multiple Species Habitat Conservation Plan, is present along Northshore Road, and approximately 150 individuals would be disturbed or removed by the proposed road construction.

Selection of the rehabilitate Northshore Road alternative would result in negligible, short- and long-term, adverse impacts to desert tortoise habitat that supports a low-density population. Mitigation has been designed to lessen the habitat impact, resulting in the permanent take of 0.28-acre of desert tortoise habitat, and restoration of 0.49-acre of previously disturbed habitat, e.g., abandoned, previously surfaced areas of road and turnouts.